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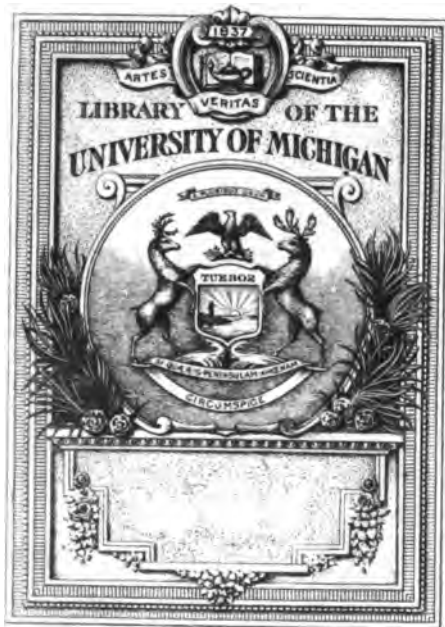
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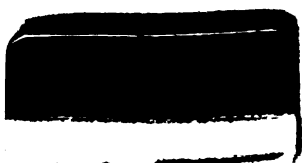


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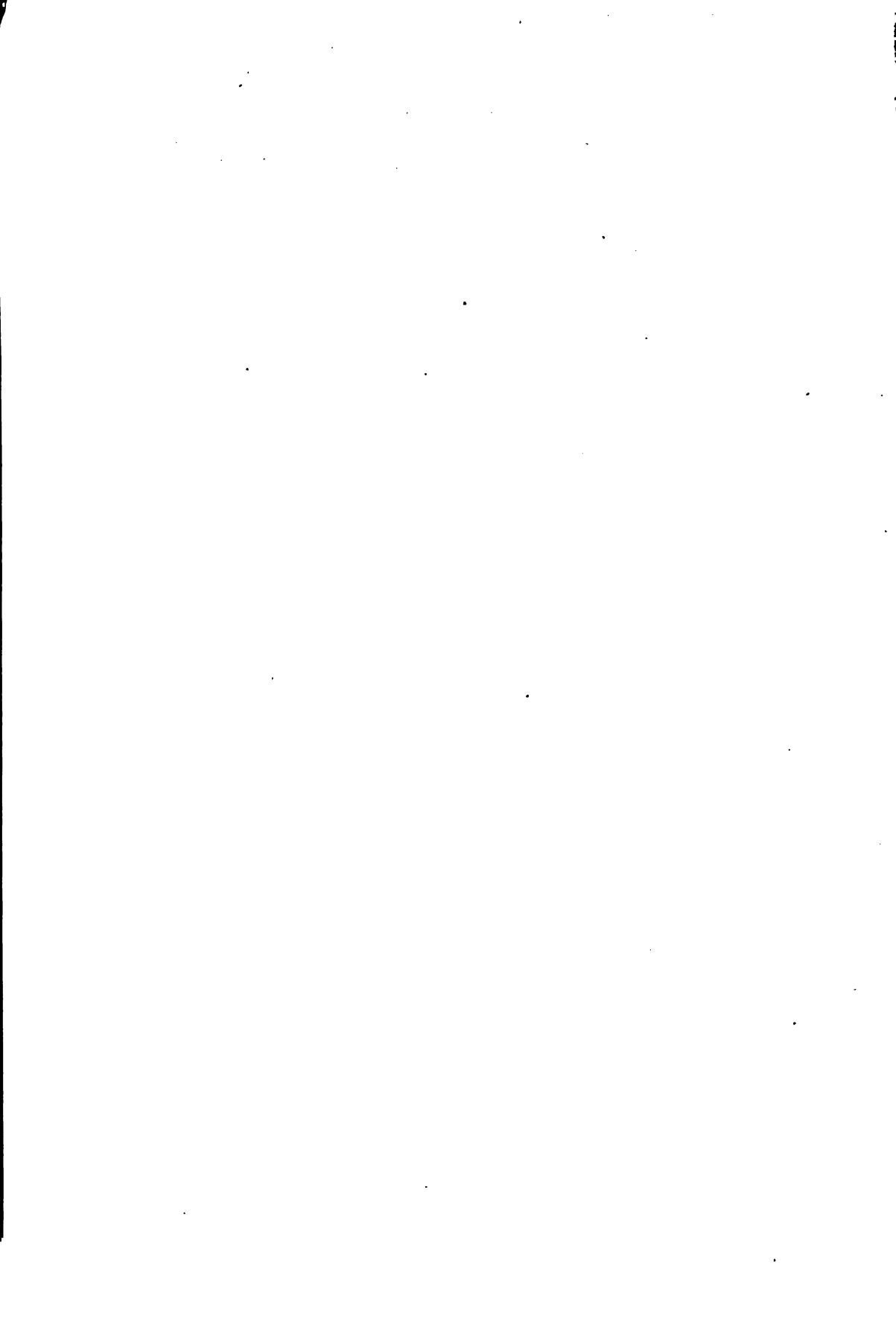
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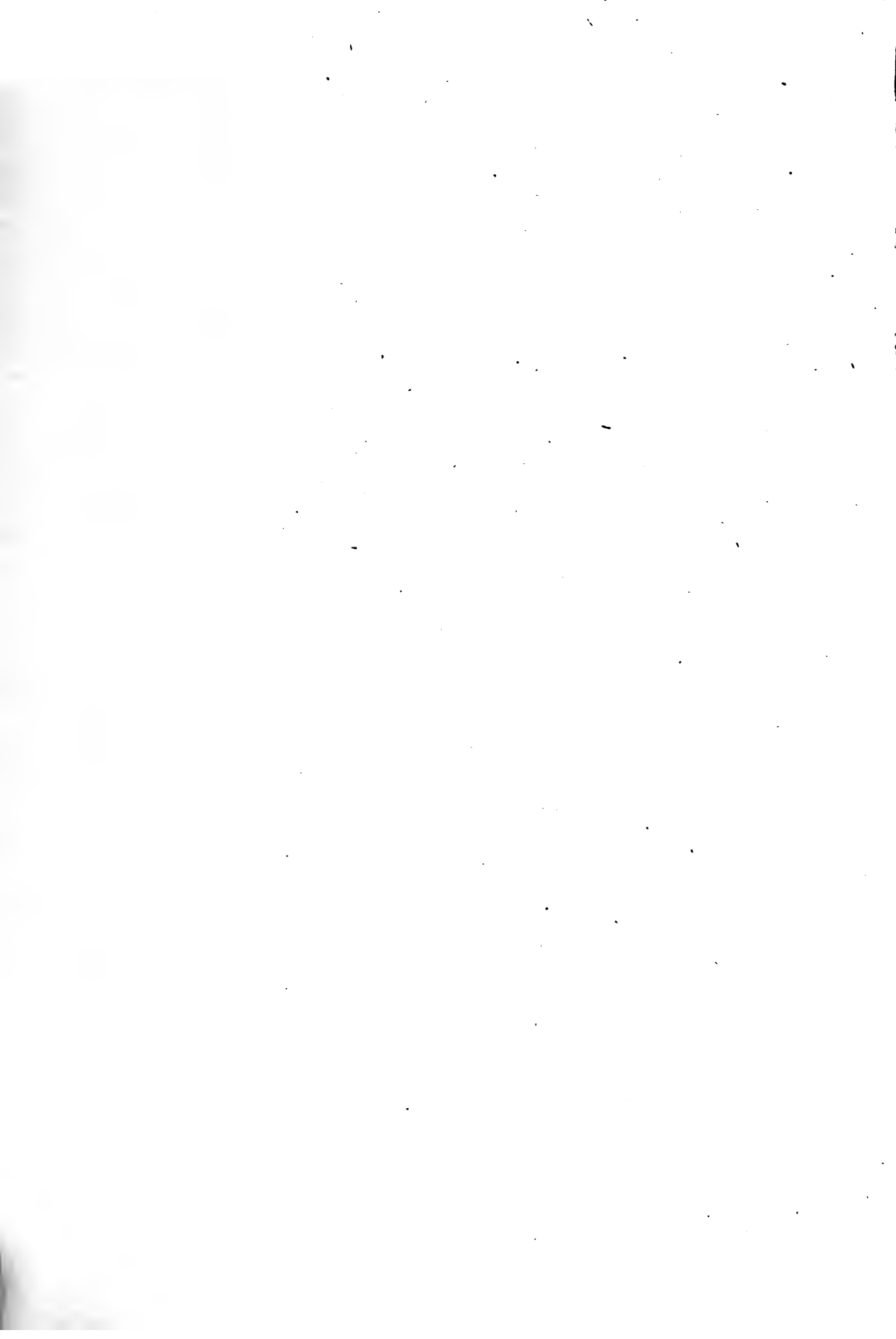
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EAST CARELIA AND KOLA LAPMARK



EAST CARELIA
AND
KOLA LAPMARK

DESCRIBED BY

FINNISH SCIENTISTS AND PHILOLOGISTS

Viktor **THEODOR HOMÉN**

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PREFACE.

After the many wars between Russia and Sweden which were fought between the fourteenth and the beginning of the seventeenth centuries, the frontier of these two countries, as settled by the Peace of Stolbova, was drawn right across the Finnish land. The territory of the Tavasts, and the smaller part of that of the Carelians, was allotted to Sweden, the former in the centre and west, and the latter in the east, of what is now Finland, while Russia obtained the eastern, and larger, portion of the Carelian land, namely practically all that between the present political frontier on the west and, on the east, the regions round Lake Bielo-ozero and the neighbourhood of the river Dvina. In previous ages the territory of the Carelians had extended further east and south-east.

The part of Finland united to Sweden had a favourable position on the Baltic Sea, with its large gulfs. After changing fortunes, which gradually developed both during the long union with Sweden, and during the union of over a hundred years duration with Russia, it has lately attained the political freedom which an industrious people needs if it is to maintain its place in the general work of civilisation.

Large numbers of the Finns to the east of the political frontier still remained in their ancient homes, as in the governments of Tver and Novgorod, in spite of the pressure of Russian immigrants from the south and east. Here they have lived a secluded life, and have to some extent retained their national characteristics and their Finnish speech. The rest amalgamated with the Russian immigrants, or were pressed back upon their kindred to the north and west of the river Svir, Lake Onega and the White Sea. Cut off from, and almost forgotten by the world, they lived their simple life on this northern countryside, maintaining themselves by primitive tillage, burn-beating, and by fishing and hunting. They made small progress in civilisation. The Russian church and government did nothing to raise them, and owing to the great difference of languages, Russian literature was inaccessible to them. With Finland, too, they had but little communication. The course of history, the difference of religion — even

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gical Lutheran in Finland and Greek Catholic in Russia — and of external conditions all combined to divide the kindred peoples. But the Carelians preserved from oblivion our great Finnish national epic, the Kalevala, and after the Finnish national awakening which the appearance of this epic helped to produce, our people began to take rather more interest in East Carelia. Students of language and of natural science began to study and learned to know the people and the country. They found there our own Finnish country and our own people, simple and undeveloped, but pure-minded and vigorous. The Carelians, too, began to feel the tie of kinship, and the desire for culture, for enlightenment and better conditions awoke in them. Intercourse across the frontier became more intimate and frequent.

But then, too, Russian nationalism came to power. The work of denationalisation in East Carelia began with the establishment of Russian elementary schools, the persecution of every one who worked to raise the popular level of education, and so on, just as we experienced it in the regions on our Russian frontier, and in political matters all over Finland. All Finnish educational work in East Carelia was forbidden, Finns were even most rigorously prevented from visiting the country. But all this terrorist rule only strengthened the more clear-sighted Carelians in their conviction that union with Finland was the only salvation for them and for their country. And the most recent events have made this clearer than ever.

In January 1918 a few Finnish scientists and philologists who were acquainted with and interested in East Carelia met to consult as to what could be done to improve the desperate condition of the kindred people across our frontier. Now that Finland was free, and that the world war offered the best prospects of success to transformations that had formerly appeared impossible, it seemed that the time had come for uniting into one strong whole all the Finnish land and Finnish people between the arms of the Baltic, the White Sea and the Arctic Ocean. To East Carelia this would mean salvation from national ruin and economic exploitation; to free Finland it would bring a substantial addition of territory and population; and for the whole land thus united it would open a perspective of progressive development and a bright and beautiful future.

Those who thus took counsel together thought that the best help they could render in the Carelian problem would be to join with other experts who had visited the Carelian territory in producing an unbiassed description of this comparatively unknown land, its natural aspects, its people, and its economic, social and political conditions. It was, of course, realised that there would be considerable difficulties in carrying out such a plan, but we determined to set to work. The war which shortly afterwards broke out in Finland, and a number of other impe-

diments somewhat delayed the completion of our task, although the various writers bestowed upon it the most self-sacrificing pains. Few meetings were held, but circumstances so ordained that the undersigned became the connecting link of our undertaking, and that he, Dr. J. G. Granö, Lecturer in Geography, and Mr. O. Lönnroth, Chief of the Statistical Department of the Board of Forests, formed a kind of editorial committee. It is therefore my pleasant duty to thank warmly all the writers, and especially these two, for the knowledge and indefatigable zeal which they brought to the work.

Dr. Granö has taken charge of the section on Kola Lapmark, has prepared valuable maps of this extensive territory from the observations made and placed at his disposal by various scientific expeditions and explorers, and has also collected from the voluminous Russian literature on the subject much information about different East Carelian conditions which is alike important and difficult to obtain. Mr. Lönnroth has not only made important contributions to the specialist descriptions in the text, but has also expended the utmost pains and consulted every available source in order to prepare a large map of East Carelia and Kola Lapmark. This map is published separately, and forms the basis both of the geographical and statistical maps in the book, and of the planimetric measurements referred to in the text. Among the many people who have assisted the work by furnishing valuable information and notes, special mention must be made of Mr. W. Olin, and Dr. Itkonen. These have provided exceedingly careful data of the population and its nationality in every village of north-western Kola Lapmark and the whole Murman Coast.

The Finnish edition of the present work was published in November 1918, and in the beginning of last year a Swedish edition, which is the same as the Finnish with the addition of a chapter on »The Claim of Finland to a Share in the Arctic Coast». The present English edition is prepared from the Swedish one, with a few abbreviations, and has been translated from the Swedish by Mrs. Mary Stenbäck.

Since the publication of the Finnish and Swedish editions the political situation has somewhat changed. The Peace of Dorpat, for example, concluded between Finland and Russia in October 1920, allotted the Petchenga territory to Finland. The suggestions about the union of East Carelia with Finland, made in the last chapter, »Final Survey of Economic, Religious and Political Life» can no longer, therefore, be carried out as easily as they might perhaps have been in 1918, when those words were written, and moreover, Finland is now considerably less able to give that country economic and moral assistance or to organise the country for the benefit of the inhabitants, owing the economic difficulties into which Finland itself has fallen since that date.

VIII

Nevertheless, we retain that chapter as it was written, almost unchanged, for from the point of view of the Carelians there has been no change for the better. On the contrary, their position is still more unhappy than it was before, exposed as they are to the oppression and terror of the Bolsheviks, and it is perhaps even clearer than it was before the revolution that the only salvation for their country is union with, or social and economic dependence on Finland.

It is scarcely necessary to add that all the chapters describe conditions as they were before the revolution of 1917.

Theodor Homén.

*Helsingfors,
June, 1921.*

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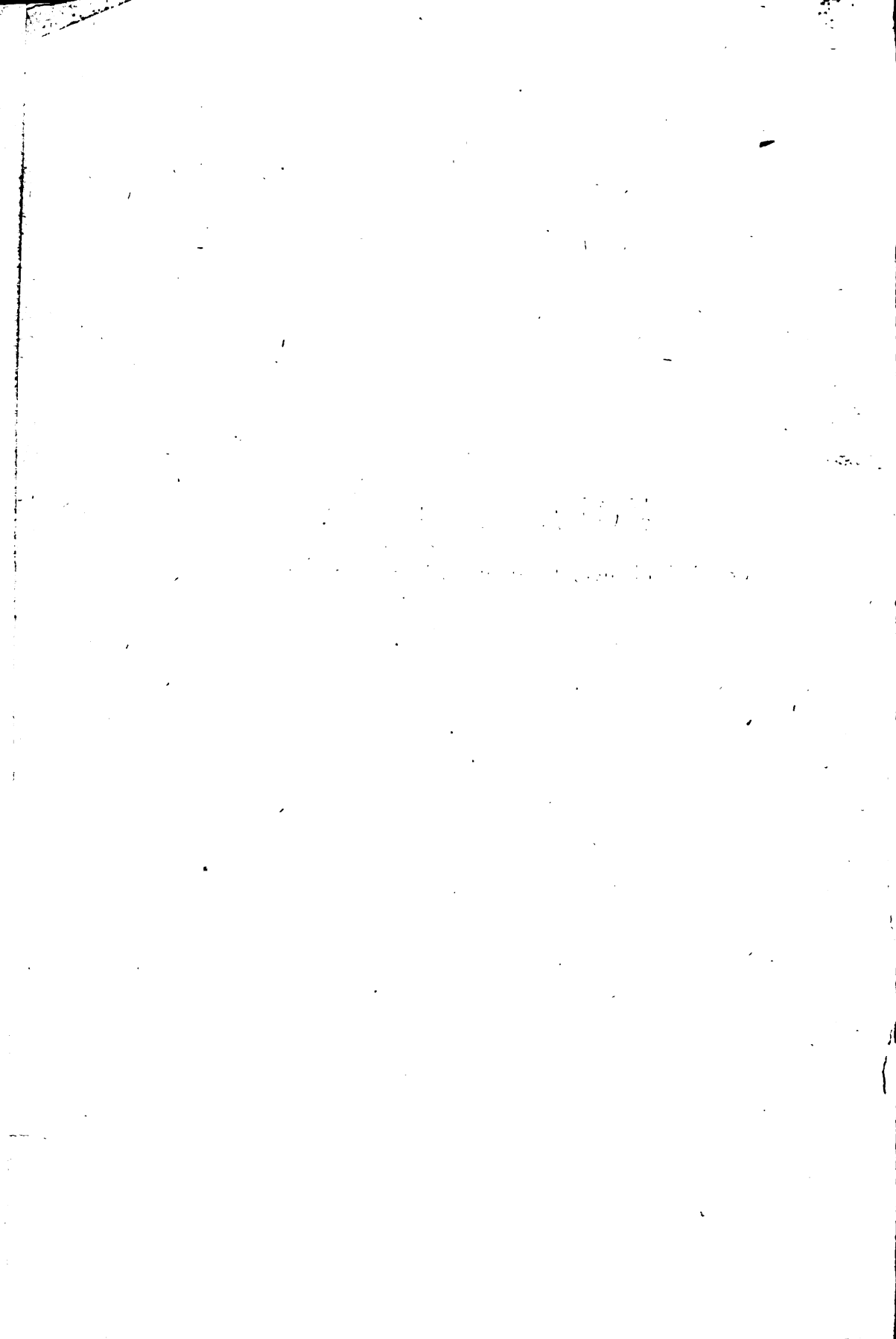
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PART I

KOLA LAPMARK

J. G. Granö, I. Itkonen, Th. Brenner, W. Brenner, and G. Sarva.



I. INTRODUCTION.

Situation, Frontiers, Area, and Administrative and Ecclesiastical Divisions.

Kola Lapmark ¹⁾ embraces the whole Kola Peninsula, together with the area between the base of that peninsula and the Norwegian and Finnish frontiers. Its most northerly point is the north-western extremity of the Rybatchi («Fisher») Peninsula, which lies in 69° 58' north latitude, or a little south of the northernmost corner of Finland. Its most southerly capes, on the gently curving south coast of the Kola Peninsula, extend south of the Polar Circle to 66° 3' north latitude. The easternmost portion of Kola is the Triostrova Islands, just north of the mouth of the river Ponoï, which lie 41° 28' east of Greenwich, 16° 31' east of Helsingfors, and thus a little to the east of the town of Archangel. Its most westerly point is at Tökyörädsh on the Finnish frontier, a little to the north of the river Luttojoki ²⁾, and lies 28° 26' east of Greenwich, 3° 29' east of Helsingfors. Thus Kola Lapmark stretches over nearly four degrees of latitude, and about thirteen degrees of longitude. It belongs to the Arctic Zone, except for the most southerly part of the coast of the Kola Peninsula, which is in the Temperate Zone. The greatest length of this territory (WNW—ESE) is about 570 kilometres (about 358 English miles) and its breadth about 280 kilometres (175 miles).

This land is surrounded by sea on the north, east and south. On the north its shores are washed by the Arctic Ocean, to the south stretches the White Sea. This is connected with the Arctic Ocean by a sound called «Görlo» (throat) on the east coast of the Kola Peninsula. The territory washed by the Arctic Ocean, stretching from the Norwegian frontier to Cape Sviatoinos in the east, is called the *Murman Coast*. The next stretch of coast, from the said cape to

¹⁾ Up to the year 1920 the whole area here described belonged to Russia. By the Peace of Dorpat the westernmost portion was ceded to Finland (see p. 59).

²⁾ The reader will find it convenient to remember the meaning of the most frequent terminations of place names; — joki = river, tunturi = fell, järvi (jaur) = lake, vaara = mountain, selkä = ridge, koski = rapids, lahti = gulf, saari = island, niemi = cape, (Trans.)

the mouth of the river Varzuga, is the *Ter Coast*, and finally, the southwestern strip of shore is called the *Kandalaks Coast*.

The frontier against Norway was fixed in Petrograd on May 14th, 1826, when the so-called »Faelles District» (= common district) was divided between Russia and Norway. It begins at Muodkevarre (called »Mudkevara» in the treaty), runs south-eastwards to Kälshomiehta (Gelsomio) on the river Patsjoki, and then follows that river and the lakes into which it expands, to a point near its mouth where the Greek Catholic church of Boris Gleb stands on the left bank of the river. The place where that church was built, »and a verst around» belongs to Russia. One verst north of the church, the frontier inclines south-eastwards across the valley of the Patsjoki to the lake where the river Lax rises, then it runs eastwards to the spot where the Jacob's river (Vuoremanjoki) takes its origin from three sources, and finally runs northwards along that river to the Arctic coast. The frontier against Finland was fixed at the Peace of Stolbova on February 27th, 1617. It runs south- and southeastwards from Muodkevarre to the neighbourhood of Kaitatunturi, keeping generally to the east of the watershed between the Gulf of Bothnia and the Arctic Ocean. Thus the great tributaries of the river Tuloma, the rivers Luttajoki and Nuortijoki, rise on Finnish territory. The boundary between the provinces of Kem and Alexandrovsk is generally regarded as the southern frontier of the territory, — probably for practical reasons — and this runs first in an easterly direction with a curve towards the south, to the region south of Lake Imandra, and then goes across the river Kolvitsajoki to the Kandalaks Coast. In this way, however, a territory which unquestionably ought to belong to Kola falls outside its boundary. A more natural frontier would be formed by a line drawn from the inner end of the Kandalaks Gulf along the valley of the mouth of the river Kantajoki and along the highest watershed of the Kaitatunturi fells to Vaatsimenoiva on the Finnish frontier.

According to Strelbitski's calculation, made in the year 1882, the area of Kola Lapmark up to the boundary of the province of Kem on the south is 155,203·7 square kilometres (60,626 square English miles), but according to a calculation made for the present work it is only about 142,500 square kilometres (55,664 square miles), or if the frontier is drawn along a line from Kandalaks to Vaatsimenoiva, about 154,500 sq. km. (60,352 sq. miles), — or rather more than a third of the area of Finland. The Kola Peninsula proper, if its boundary be drawn from Kandalaks on the south, along the river Niva, Lake Imandra and the river Kola to the Kola Fjord, takes up about 98,500 sq. km. (27,131 sq. miles), while the remaining 46,000 sq. km. (17,969 sq. miles) is formed by the western mainland, which thus roughly corresponds in size to

the province of Kuopio in Finland. According to Trofimenko's calculation, made in 1872, 27 % of Kola Lapmark consists of forest, 9 % of lakes and rivers, and no less than 64 % of bog or tundras.

From the point of view of *administration*, the whole of Kola Lapmark belongs to the government of Archangel, and, apart from the south-western corner which belongs to the province of Kem, it forms a single province or ujezd, called *Alexandrovsk*. It is in area the largest province of European Russia except Petchora. Its capital, Alexandrovsk, lies on the western shore of the Kola Fjord. Like all provinces in Russia, it is divided for local government purposes into communes or volosts, and these volosts are divided into village communities or obtchestvos. There are six volosts. The settlements on the Murman coast form the *Volost of Murman Settlements*, (Murmanskoi kolonistskaia volost); the greater part of the interior, with its Lapp villages or pogosts, belongs to the *Kola Lapp Volost* (Kolsko loparskaia volost); the area of the river Panoi and the north-western corner of Kola including Sviatoinos forms the *Panoi Volost* (Ponoiskaia volost); while the southern part of the peninsula is divided between the volosts of *Umba* (Umbskaia volost), *Kuzomen* (Kuzomenskaia volost) and *Tetrina* (Tetrinskaia Volost).

The *ecclesiastical divisions* only partially correspond to the political ones. The whole of Kola Lapmark except the very ancient monastery of Petchenga or Petsamo, which is under the Moscow synodal administration, belongs to the diocese of Archangel, and is divided into two deaneries or blagotchinies. The *first deanery*, to which belong the Volost of the Murman Settlements and the Kola Lapp Volost, is divided into nine parishes, (Gavrilovsk, Kildin, Kitovsk, Lovosersk, Notosersk, Pazretsk, Petchenga, Teriberka and Rynda), while the *second deanery* embraces the volosts of Panoi, Umba, Kuzomen, and Tetrina, and is divided into seven parishes (Varzuga, Kasharantsy, Kuzomen, Panoi, Tetrina, Umba and Tchapoma). There are also three town parishes. Kola, Alexandrovsk and Murmansk. The Finns have a Lutheran pastor of their own in Alexandrovsk.

J. G. GRANÖ.

Physical Features, Flora and Fauna.

1. Configuration and Altitudes.

From the point of view of physical features Kola Lapmark is intimately connected with Finland and Scandinavia. All these territories, together with East Carelia, form, in respect to their natural conditions, a single whole, which is called Fenno-Scandia.

4

The area to the west of Lake Imandra and for some leagues to the east of it, forms a direct continuation of the Finnish Lapmark, and has a broken landscape of tundras and fells, alternating with bogs. The heights are, however, greater than in Finland, and the continuous mountain systems cover wider stretches of land than in Finnish Lapmark. A number of groups of mountains may be mentioned as forming a continuation eastwards of the Saariselkä in Finland; — Sarvestundar, Vunastundar, Rastimtundar, all of which lie on the southern side of the Luttojoki. To the south-east of the Nuortijoki we find a large mountain system which includes the heights of Siulutaldi and Vuojim, which rise to 1,000 metres and more above the sea, while further to the south-east the Petchajoki has its sources in the Tuodasch tundra. Among the noteworthy heights in the southern districts may be mentioned Katinkultanturi, 560 meters high, and Riekkolatvatunturi, 687 meters, west of Babinskaia Imandra. Still further to the south, between the Kandalaks Gulf and the Finnish frontier, are the Kaitatunturi, fells with heights of over 500 metres.

The greatest heights, and those most worthy of notice are Tchuin, Montche and Voltchia or Namdes on the west of Imandra, and on the east of that lake Umptek or Hibinä, a very extensive mountain group, which stretches eastwards to the Umpjaur lake. To the east of Lake Umpjaur again, there rise the mighty heights of Lujaur-Urt (Fig. 1). All these last-named attain a height of about 1,000 metres above the sea, and Umptek as much as 1,200 metres. The Umptek fells, the largest group, cover an area of 1,145 square kilometres, and Lujaur-Urt 485 square kilometres. The scenery of these mountain areas is wild and desolate. The sides of the valleys are formed by steep precipices, while their bottoms are generally level. Many of them are exceedingly inaccessible, and large mountain areas have a completely alpine character.

South and south-east of these fells there is a tract with more varied scenery, also including several very considerable heights, which, however, gradually merge into the almost plainlike surface of the eastern portion of the Kola peninsula (Figs. 2 and 3). North of the fells, again, several tundras can be noted. Here are Maaselg and Viruaiv (600 metres) and further north again, to the east of the town of Kola, Vilkisvum, (about 400 metres). On the northern part of the Kola Peninsula also, the tundras get lower and less prominent, as one goes eastwards. Some names may here be mentioned; — Pulmasuaiv and Paitspahk on the eastern side of the Voronie river; Poarresuaiv and Vytsepahk in the middle of the Kola Peninsula, north of the river Ponoï, which two mountains are connected with an extensive mountain system of no great height; Schuur-Urt and Saiht-Urt. The greater part of the eastern area is occupied by a desolate plateau rising some 100—150 metres above the sea. Above this

rise the tundras, whose limits are in many places clearly marked, while in other places the level plateau gradually merges into higher hills and mountains.

There is thus a clearly marked difference of configuration between the eastern and western portions of the Kola territory. Wide plains with scattered tundras are characteristic of the eastern part, while the western regions are much broken, with in places fairly considerable heights. The fells here cover wider expanses, and are surrounded by smaller hills and mountains. The whole territory is pervaded by great quantities of swampy land, which sometimes lies between the fells, and sometimes upon them, often at a considerable height.

2. The Coasts.

The character of the coasts and shores depends upon the general formation and topographical conditions of the country. The whole stretch of coast is marked by its exposed position and the absence of any archipelago worth mentioning. It is calculated that only 431.2 square kilometres of the whole area is occupied by islands, and this includes the large island of Kildin.

The *Murman Coast* can conveniently be divided into an eastern and a western section, chiefly according to the character of its shores. The deep Kola Fjord would form the dividing line. *West Murman* resembles on the whole the coasts of South Varanger. We find here deep fjords, which afford good anchorage, surrounded by lofty cliffs, and in places desolate precipices. Here is the great Rybatchi Peninsula (1400 sq. km). Its southern portion is called Sredni, and is divided from the northern part by the Gulf of Ozerko, (a good harbour), on the east, and the Bumaz Fjord on the west. The Rybatchi Peninsula is separated from the mainland on the east by a large gulf called Muotkavuono. The shores of the Rybatchi Peninsula are completely exposed and very varied, consisting in places of high mountains, while elsewhere the land is low and the water shallow. To the west of it comes the deep Peisen or Petchenga Fjord, while to the east lie the Titovka, Litsa, Aara and Uura Fjords. The Kola Fjord, which is the deepest, 60 kilometres long, and curved westwards in an elbow, affords an exceptionally good harbour. In the mouth of the Kola Fjord there are many smaller fjords, and several islands, of which Toros is the largest. Here too lies the port of Jekaterinskaia-gavan (called Alexandrovsk after the year 1889), shut in between lofty cliffs.

The coast to the east, *Eastern Murman*, gets lower, and the deep fjords disappear. About 20 kilometres east of Kola Fjord lies the island of Kildin, which

is separated from the mainland by a navigable sound. The rivers debouch in gulfs, of which the largest is at the mouth of the Varsin, while another of considerable size lies just west of Sviatoinos. Many of these gulfs are full of shallows, and on each side of them the coast is exposed and barren, with its desolate, rocky shores. There are a few islands, of which may be named the Sem-ostrovo Archipelago (the Seven Islands), outside the Harlovka river, Nokujev, in the gulf at the mouth of the Varsin, and Jokonskie, west of Sviatoinos. Sviatoinos itself is a pointed cape, about 18 kilometres long, which juts straight out into the sea towards the north-north-west. East thereof begins the *Ter Coast*, the northern portion of which resembles in the main the eastern part of the Murman Coast. There are here similar rocky shores with gulfs here and there, such as Lumbovskai, which has a fairly large island at its entrance. On the eastern coast of the Kola Peninsula the river Ponoï debouches in a fjord which is surrounded by high shores. Somewhat to the north of this we see three islands, Triostrova, which lie outside the easternmost cape of the Kola Peninsula, Orlov. South-westwards from the Ponoï, the shores take on a different character. They get still lower, and long stretches show no rocky land at all, only sand and shingle, which can even extend for a couple of kilometres inland before meeting the higher ground. In other places the narrow strip of shore is bounded, very close to the actual beach, by steep precipices some tens of metres high. Generally speaking the shores are shelving, and not infrequently sand banks occur several kilometres from the water's edge. There are no gulfs of any size, and the only island worth noting is Sosnovets. The coast is therefore entirely exposed to the storms of the White Sea, but the waves which roll in upon the *Ter Coast* often break against sand banks and shallows far from the shore.

The same kind of coast extends far into the Gulf of Kandalaks. No change occurs until the Turja (*Ter*) Peninsula is reached. Then the shores again become higher and rocky. The westernmost point of *Ter* is a steep precipice about 100 metres high. Towards the north-west islands become more numerous, and the coast is deeply cleft, but still not especially high. Among the gulfs Umba and Porja-guba may be mentioned. Outside the latter there are many rocky islands. The further one penetrates into the Gulf of Kandalaks, the higher and steeper its shores become, and near the village of Kandalaks and in the Kolvitsa Gulf the cliffs attain a height of nearly 200 metres. There is a low, narrow strip of shore along the water's edge, and from this the cliffs rise steeply. Islands are scattered here and there, and give the scenery an attractive appearance.

The above shows that in the high-lying parts of Kola Lapmark the coasts

are rocky, with long fjords and sheltered harbours, while the shores of the level, almost plain-like eastern portion are less deeply cleft, and little accessible to vessels.

3. The Rock Foundation and Soil.

The rocks are in the main of the same kinds as in Finland and the greater part of Fennoscandia. The chief are gneis and metamorphic schists, interspersed with granite, both red and grey. Sometimes the granite forms considerable masses, becomes coarse grained, and sometimes porphyritic. Darker basic rocks are also widely spread over the land. In places we see black veins of diabase sharply intersecting slate and gneis, as on the Murmar Coast, while in other places there are large basic blocks, as in the Montchie and Voltchia tundras, and gabbroid rocks on the river Varzuga. Metamorphosed basic rocks are found in a wedge-shaped area, running west-north-west from the tracts between Kandalaks and Porja-guba towards Hirvasjärvi and the Finnish frontier. They are rich in garnets, and often have a kind of eyestructure which is very characteristic.

The great fells of Umptek and Lujaur-Urt occupy a distinct position in this area. They consist of a comparatively rare rock, nepheline-syenite, with a number of variations, and form the largest known continuous blocks of that rock. This rock decomposes with peculiar ease, so that these mountains are in most places covered with loose stones and boulders. Closely connected with this mass is an iolite rock on the Ter Peninsula, east of the village of Umba.

Rocks of more recent formation and a different character from the above occur on the Rybatchi Peninsula and the island of Kildin, and also at places on the Ter Coast, as at Ponoï, Tchapoma and Varzuga. They chiefly consist of slates and sandstones, red and grey.

So far as is at present known, Kola Lapmark is not rich in *ores or useful minerals*. Veins of galena have been discovered, thinly scattered over different portions of the territory. These are fairly common round Umba on the northern coast of the gulf of Kandalaks. Finnish researchers who have visited the country hold that they are too thin and poor to have any practical value. More promising veins of lead have been discovered in north-west Kola and on the Murman Coast at Dolgaia-guba (Falke Fjord) and Bazarnaia. These are veins of calcite quartz, often rich in ore, and sometimes as much as 25 centimetres broad. These ores sometimes contain silver, and sometimes also zinc blende. As stated in the chapter on industry, a beginning has already been made in the working of these finds. These deposits of lead ore are therefore

to some extent deserving of attention, and especially of thorough investigation. Finns have taken part in certain mining undertakings.

The soils show here, as also in Finland, the effects of the land-ice. A mighty layer of moraine gravel covers the greater part of the territory. Here are ridges and moraine hills, the latter often exceedingly stony. Owing to the fission caused by the intense cold, many of the higher mountains are absolutely »seas of boulders» and look at a distance like enormous piles of gravel. (Fig. 4). Peat formations cover large areas, and the layers of peat are of considerable richness. It is well known that in northern places the turf in swamps and bogs can swell up into knolls and hillocks which often reach a height of 2 or 3 metres above the level surface of the bog (Fig. 5) The soil along the rivers and watercourses consists partly of silt, and in many places on the Ter Coast and inland there are old river strata of silt and sand. In many places on the coast, as for example at Kuzomen, there are extensive sand dunes.

4. The Inland Watercourses.

According to Strelbitski, *inland lakes* occupy 7,035.5 sq. km. or 1/22 part of the whole area of Kōla Lapmark. The three largest lakes lie in the districts between the Gulf of Kandalaks and the Kola Fjord. Here there is the great lake of *Imandra*, with a surface of about 1,100 sq. km., enclosed by high mountains on both sides, with countless capes and inlets. This lake is divided into two parts »great-Imandra», the northern half, which lies north and south, and »Babinskaia-Imandra», which stretches to the west from the southern end of the northern half. A line drawn along the lake from its western corner to the northern end would be about 120 kilometres long. The average breadth of the lake is 15—20 km. Low islands are scattered about it here and there. Imandra receives its water from the melting snow upon the fells, and from the lakes Pirijärvi and Salmijärvi to the west. The last-named receives the waters of the Juonnijoki river, which rises in the frontier tracts which border on the Finnish parish of Kuolajärvi. In the north, Imandra receives the waters of a river which comes from Permjaur, and in the north-east the river Pietsjok, which rises in several small lakes. Imandra runs out into the Gulf of Kandalaks, through the Niva, a very swift river which contains many rapids, but nevertheless broadens out in several places. This river falls 128 metres in its length of 30 kilometres.

Just as Imandra lies enclosed between the fells of Montche and Voltchia on the west and Umptek on the east, so too Umpjaur lies between Umptek and Lujaur-urt. This lake is about half the size of Imandra, and has the same



Fig. 1. Lake Seitjaur and the Fells of Lujaur-Urt.

Photo *J. A. Palmén.*



Fig. 2. Fell Landscape from Central Kola. View towards the north from Urm-oaivi Fell.

Photo *J. A. Palmén.*



Fig. 3. East Kola Plateau and the Ponoï River.

Photo *J. A. Palmén.*



Fig. 4. Rapids in the Mouth of the Kola River, and the Moraine Ridge of Salovareka.

Photo *J. A. Palmén.*



character of an alpine lake. The water is collected from the surrounding fells alone, and runs out in the Uмба river, through a long, narrow lake called Kan-ozero. This river has its mouth in the Gulf of Uмба, beside a village of the same name. Here also there are many rapids, some of which, situated about 8—12 kilometres from the mouth, are worthy of note. The third great lake is Lujaur, situated to the east of Lujaur-urt. Like Umpjaur, this lake forms a basin into which many mountain streams collect. It runs out to the north, in the great river Voronie, which after receiving a number of tributaries, such as Kurkjok, Njukjok, Uimjok, Tchudisjok, Lanjjok and Liekjok, and a still larger number of unnamed streams, flows out into the Arctic Ocean at Gavri-lovo as a mighty river.

The five largest rivers of the Kola Peninsula have their sources in the same area as contains its greatest lakes. The Uмба and Voronie already mentioned rise here, as well as the Joukjok, Ponoï and Varzuga. Their sources all lie in the neighbourhood of Umpjaur and Lujaur, within a space of scarcely 50 square kilometres. The Joukjok flows out into the Arctic Ocean immediately to the west of Cape Sviatoinos. It has its sources in the neighbourhood of Lujaur, around the lake of Tchinglasmana. It flows thence eastwards, through a number of smaller lakes, between the heights of Saiht-urt and Tcharr, from which it receives a number of large tributaries. The river Ponoï, the longest on the Kola Peninsula, has its sources about 20 kilometres east of Lujaur, from whence it runs, with many loops and through a number of lakes, including Vuljaur, east-south-east to the eastern end of the Kola Peninsula. During its course it receives a number of little known tributaries on both the right and the left banks. The basin of the Ponoï is not broad, as a number of other large rivers which fall into the Arctic Ocean and the White Sea have their sources far up in the interior of the country. The fifth great river within this territory is the Varzuga. One of its largest sources is the Pana, which rises about 20 km. south of Lujaur. The sources of the Varzuga are spread over an exceptionally wide area. Its lowest reach runs south-eastwards for about 100 km. and receives a number of tributaries, including one from the great lake of Serg. The northern end of this reach joins on to the Upper Varzuga, which runs in a great, pointed curve to the south-east from several smaller lakes situated about 20 km. away from the river Ponoï, and also receives a large number of tributaries, including the Pana and the Indela.

In addition to these five great rivers, there are several smaller ones, of which the following deserve mention. Towards the Murman Coast there flow the Teriberka, from the lakes of Rypjaur and Teriberkajaur, the Rinda, the Kaarlovjok from Lejjaur and Njeemjaur which are situated near the sources

of the Joukjok, the Litsa, and the Varsina from the lakes of Nisanjaur and Jenjaur. On the south-east Ter Coast the chief are the Åkjok from Akjaur, the Pjalitsa, the Tchapoma, the Strelna and the Tchavanga, the last of which rises in the considerable lakes of Verhneie, Sredneie and Nischneie Andomozero. Further to the west, in the Gulf of Kandalaks, only smaller rivers have their mouths. The only one of any importance is the river that flows from the lake of Kolvitsa.

A characteristic common to most of the rivers here mentioned, is that in the interior of the Kola Peninsula they flow calmly, while nearer to the coast they are rich in rapids. Many of these rivers have not, in their upper reaches, carved out any marked river bed, and only fall into deep water-worn valleys, with precipitous sides, some ten or twenty kilometres from the coast. The rivers Ponoï (Fig. 3) and Thapoma (Fig. 6) form typical examples.

Most of the great bogs and numerous lakes west and north of Imandra have their outlet in the Kola Fjord. The great lake of Guollejaur, north of Imandra, is only separated from the Imandra waters by a watershed half a kilometre wide, and flows out through the lakes of Puljaur and Murtjaur by the swift Kola river, which has cut its way deep into the moraine gravel. (Figs. 4 and 7). The Kola Fjord also receives the river Tuloma from the west, but that name is only applied to the lower reaches of the river, below the long and narrow lake of Nuortjaur. There are many mighty rapids in these reaches, and the confluences of large tributaries, among which the Pietsjok (Petäjäjoki) on the south, is the largest. The lake of Nuortjaur is about 90 km. long and scarcely one kilometre wide. Its northern half extends in an easterly direction, while the southern portion lies almost north and south. At the bend the river Luttojoki runs in, coming from the west, beyond the Finnish frontier, and gathering its waters from a countless number of lakes and streams on both sides of its sinuous course. The lake Nuortjaur also receives rivers from far to the south. The river Hirvasjoki (Sörvisjoki) comes from the lake Hirvasjärvi and joins the Nuortjok, which comes from the south-west, beyond the Finnish frontier, and has already received the waters of a large river, the Jaurjok, which flows from the west. Thus the Nuortjok is already large and swift when it falls into the lake of Nuortjaur, which, after receiving also the Luttojoki, flows out into the Kola Fjord. Four important rivers have their mouths in the Arctic Ocean on the western Murman Coast; these are the Peisen, or Petchenga, west of the Rybatchi Peninsula, the Titovka, the Litsa and the Uura, which debouch in the fjords with the same names.

All the rivers in Kola Lapmark have very irregular courses. They swell out into a series of lakes, so that a boat journey along these beautiful water-

courses does not in the least give the feeling of travelling down a river. Then all at once the lake will grow narrow, and suddenly a seething rapid presents itself. When this is successfully passed, there may be calm water to navigate. Many of the large lakes marked upon the map are only expanded reaches of the rivers.

TH. BRENNER.

5. The Sea.

The *Northern Arctic Ocean* is comparatively shallow on the Murman Coast. Further out, however, the depth increases so rapidly that three or four kilometres from the coast navigation is quite without danger; There are no shallows, and no islands except the Hen Islands or Haneija on the southern side of the Rybatchi Peninsula, and Kildin. Further from the coast the sea bottom has a general tendency to rise from west to east. Examination of the chart in the latitude of Vardö, for example, shows that the greatest depth, about 450 metres, occurs near that town; on the meridian of Kildin the depth is 250 metres, in the longitude of Sviatoinos at most 180 metres, outside Cape Kanin 90 metres, and in some places only 65 metres. The contours of the sea bottom vary more in the Varanger Fjord than off eastern Murman, where the depth is practically the same over an extensive area. Soundings between the Kola Fjord and Sviatoinos show that at first the bottom sinks so steeply that the curve of 130—150 metres depth runs only 3—7 kilometres from the coast. Further out, the depth increases more gently, so that 60 km. from the coast it is about 190—170 metres opposite the Kola Fjord, and only 150 m. in the longitude of East Litsa. Above this comparatively level submarine plain rise two quite low, gently sloping ridges or «korga» (thresholds), which in the main follow the line of the shore. The inner one begins in the west near Teriberka, approaches the coast — to about 10 km. therefrom — off Rynda, and then turns eastwards towards Cape Kanin. As far as is known the outer one lies about 20 km. further out. The fish follow in their wanderings the even furrows formed by the shore and these ridges, so that the distance from the coast to the fishing grounds is shortest at Rynda.

The «throat» of the *White Sea* is comparatively shallow. At its mouth, the depth is almost everywhere less than 50 metres. Further south, the deepest channel only exceeds 100 metres at one point, while the curve of 50 metres depth runs at least 10 km. from the coast. The Gulf of Kandalaks is considerably deeper. Soundings of over 300 metres have been taken at its mouth,

and off the Ter Peninsula the curve of 200 metres depth runs only two to three kilometres from the shore.

The *Warm North Cape Stream* is a factor of great importance to the climate and the economic life of the country. This is a branch of the Guif Stream, which runs from the north of Norway, past Murman and Kanin, towards the double island of Novaia Zemlia. Its mitigating influence upon the climate is most perceptible in western Murman, where it runs at a distance of only 90—110 kilometres from the coast, and where also it is warmest. It is still of no little importance at Gavrilovo in the west of East Murman, for thus far it follows the line of the coast towards the east-south-east, but then it turns due east, while the coast curves to the south-east, so that the mainland no longer feels its influence. The limits of the North Cape Stream are much less definite than those of the Gulf Stream in the Atlantic. In addition, however, to its influence on the climate, conclusive evidence of its existence is to be found in its temperature (about 2.5° Centigrade at the end of the winter, 9°—11° Centigrade in the summer, perceptibly higher than the temperature of the surrounding sea), its clear, blue, transparent water, and above all the remarkable surface current, (22 kilometres in the 24 hours at the North Cape, about 18 kilometres off Murman, and about 30 km. at the eastern side of Sviatoinos). Off Eastern Murman, between the mouth of the Voronie and Sviatoinos, there is a weak *cold coast stream*, which flows from south-east to north-west.

The currents in the White Sea have not yet been investigated in detail. As far as is known there are no clearly marked, permanent streams.

The *tidal changes* are very noticeable on the whole coast of Kola Lapmark. On the Murman coast the resulting currents follow the direction of the shore. The flood runs from the west or north-west, the ebb from the south-east or the east. The height of the tide varies on the Murman Coast between 1.8 and 3.7 metres. The spring tide in the neighbourhood of Sviatoinos for example, is over 4.5 metres. The pace of the tidal stream is on the open coast 2.4—3.6 kilometres per hour ($1\frac{1}{2}$ — $2\frac{1}{4}$ miles per hour) while in narrow sounds, for example between the island of Kildin and the mainland, it is 8—9 km. (5 miles) per hour. The greatest pace has been observed inside the Kola Fjord, at the mouth of the Tuloma; sometimes in the spring it reaches as much as 14.5 km. (9 miles) per hour. On the southern coast of Kola the tide never reaches a greater height than two metres, but on the east coast, where the flood water from the Northern Arctic Ocean is forced into the narrow «throat» of the White Sea, its height is 5—6 metres at a number of places, and at Triostrova for example, 7 metres or even more. The pace is about 8 km. (5 miles) at the

mouth of the White Sea, in the »throat« at most 6.5 km., and in the main basin and the Gulf of Kandalaks at most 3.5 km. per hour.

The *saltness* of the water varies between 3.2 and 3.4 ‰ on the Murman Coast, is between 2.5 and 2.9 ‰ in the north of the White Sea, but towards the south, under the influence of fresh water from the rivers, sinks to 1.5 ‰. (The corresponding figure in the Gulf of Finland off Helsingfors is 0.5 ‰). The saltness of the water at the bottom is 3.5 ‰ in the »throat«, and 3.0 ‰ further south, in the middle of the basin.

The sea on the Murman Coast is ice-free during the winter, except that pack-ice sometimes occurs at Sviatoinos and Gavrilovo, driven thither by the cold coast stream already mentioned. This pack-ice seems generally to come from the White Sea. Only the fjords which penetrate furthest into the land (Kola, Peisen, Uura, etc.) are frozen in their inmost arms, generally from the middle of November to the beginning of May, and some years even longer. The White Sea freezes most winters, as, being shallow and less salt, its surface cools more quickly when autumn comes. Its great gulfs freeze in the middle of November to more than half their length. The Gulf of Mesen alone remains open all the year round, except for a shallow belt by the shore, which freezes.

6. Light and Climate.

As practically the whole of Kola Lapmark lies within the Arctic Zone, the length of the day varies very greatly at the different seasons. In the southernmost part of Kola, near the Polar Circle, Midsummer day and Christmas night each last nearly twenty-four hours, but on the northern coast of the Rybatchi Peninsula the summer day lasts for 65 days, and the winter night for 60 days. In Murman the long summer day begins about May 26th, and comes to an end about July 18th. The midnight sun is, however, seldom visible, as at that season the northern sky is generally covered with clouds. At the end of August artificial light has to be used in the houses, and at night the stars are clearly enough visible for mariners to use them for sextant observations. By the middle of September no more red glow can be seen on the northern horizon at night, and from November 27th to January 17th the night is unbroken. In clear weather however there is for a couple of hours in the middle of the day strong enough light in the south to read by. The darkness of the winter night is to some extent dissipated by the moonshine and the northern lights. These latter are very often visible, but their light is scarcely stronger than that of the moon.

With regard to *climate*, Kola Lapmark is something of an exceptional area, in that geographical latitude is not conclusive. This is due to the influence of the Gulf Stream. The annual mean temperature is highest in the northernmost part of the territory, on the Rybatchi Peninsula, lowest in the interior of the country and on the east coast. At Vaida-guba, in the north-west corner of the Rybatchi Peninsula, the mean temperature is the same as at Kajana, nearly six degrees further south. There is only a small area in the heart of Kola where it is as low as at Enare, which lies in about the same latitude. It must be noted that only a narrow strip round the coast has a real marine climate. The inner arms of the longest fjords have a climate which is quite continental. The annual mean temperature, however, does not everywhere sink from the sea towards the interior of the country. At some places on the Ter Coast for example, the mean temperature is lower than in the interior.

The *mean temperature* in different parts of Kola Lapmark is shown in the following table. These figures must not, however, be regarded as perfectly reliable, as they are based on relatively short observations.

Station	Latitude North	Longitude East	Monthly Mean Temperature. (Centigrade)			Annual Mean Temperature.
			Highest	Lowest	Difference	
Petsamo (Petchenga)	69°31'	31°04'	10.3 (July)	-14.9 (Feb)	24.9	-0.75
Vaida-guba .	69° 57'	31° 58'	8.7 (Aug.)	- 7.9 ..	16.6	+0.62
Alexandrovsik	69° 12'	33° 28'	9.9 (July)	-12.5 ..	22.4	-0.30
Town of Kola	68° 53'	33° 0'	11.3 (July)	-15.9 ..	27.2	-1.05
Teriberka . .	69° 10'	35° 9'	9.9 (Aug.)	-11.6 ..	21.5	-0.15
Sviatoinos . .	68° 9'	39° 49'	8.8 ? ..	-10.2 ..	19.0 ?	-0.75
Orlov	67° 11'	41° 22'	8.9 ..	-12.8 ..	21.7 ?	-1.62
Ponoi	67° 8'	41° 21'	10.8 ..	-13.6 ..	24.4	-0.45
Sosnovets . .	66° 29'	40° 48'	8.3 ..	-13.2 ..	21.5	-1.57
Varzuga . . .	66° 20'	36° 37'	11.7 (July)	-17.4 ..	29.1	-1.20
Imandra . . .	67° 44'	33° 22'	12.1 ..	-16.6 ..	28.7	-1.05
Lovozerisk . .	68° 9'	35° 6'	11.1 ..	-16.7 ..	27.8	-2.02

Of the above-named places, Vaida-guba, Teriberka, Sviatoinos, Orlov and Sosnovets are situated right on the sea coast, while Alexandrovsk is a short distance from it. The others all lie in more or less clearly marked continental areas, not excepting Kola and Petchenga (on the Peisen Fjord), both



Fig. 5. Peat Knoll on the bank of the Voronie River.

Photo J. A. Palmén



Fig. 6. Rapids in the Tchapoma River.

Photo Thord Brenner.



Fig. 7. Rapids in the Kola River.

Photo J. A. Palmén.



Fig. 8. Group of Firs by Lake Lujaur.

Photo J. A. Palmén.



Fig. 9. Old Pine Forest on the Upper Ponoï.

Photo J. A. Palmén.





Fig. 10. Mixed Forest of Birch and Fir on the Lower Reaches of the Ponoï.

Photo *J. A. Palmén*.



Fig. 11. Birch Forest on the Njuammel River in the Interior of Kola.

Photo *J. A. Palmén*.



of which lie at the inner extremities of fjords. The differences between the coast and inland climates are reproduced in the appearance of the landscape, for the warmer summers of the inland produce a richer vegetation. What a difference there is in this respect between Vaida-guba and Petschenga for instance, or between Teriberka and Kola! In considering the inland climate the altitude and nature of the surface must be taken into account. Thus, it should be mentioned that though Imandra and Lovozersk lie near together, they are divided by high fells.

The *rainfall* is generally speaking low. There are seldom very wet summers or very snowy winters. The greatest falls have been measured in the westernmost areas and on the coast, but even here the moisture practically always falls as a Scotch mist or in the form of exceedingly fine hail. Heavy rain and snow in large flakes are comparatively rare. On the coast the annual rainfall averages 300—400 millimetres ($11\frac{3}{4}$ — $15\frac{3}{4}$ inches) or lower than in a large part of Finland. In the interior of Kola it is only 200—300 millimetres, and in some places scarcely more than 150 millimetres (less than 6 inches). The greatest rainfall, one-fifth or one-fourth of that of the whole year, occurs in July, the least in January or February. For further particulars, see under «climate» in the section on East Carelia.

There is scarcely any place in Russia where there is as much *cloud* as on the Murman Coast and in the «throat» of the White Sea. There are less than 20 clear days in the year. Clouds have been estimated to cover on an average 65—75% of the sky, or a rather higher average than in Finland. In the autumn the percentage in some parts reaches 85.

Fog is a great hindrance to navigation and fishing. In the spring and early summer, while there is still ice in the White Sea and near Kolguev, the fog on the Murman Coast is often so thick that it is impossible to see more than fifty yards ahead. Then, if the weather is calm, the condensed fog forms a floating layer of fresh water on the surface of the sea. Later in the summer, and in the autumn, fog is less frequent. It then occurs chiefly with a north-westerly or easterly wind, and collects principally in the mouth of the White Sea. Winter fogs occur most often in West Murman.

Winds. During the cold season (September to May) the south-west wind prevails. In the spring the wind is generally north-westerly, in the summer northerly, north-east or easterly. Quick changes of the wind are a characteristic of Kola Lapmark. *Gales* occur chiefly at the changes of the seasons. A week or ten days before the autumn equinox, i. e. in the middle of September, there is in most years a very strong and devastating northerly gale for three days on end. Winter blizzards generally come from the south-west.

Natural processes, such as the snow-melting, the budding of the trees, the falling of the leaves in the autumn, the formation of ice on the water, the migration of the birds, etc., show that the division of the year into four equal seasons of three months each does not correspond to the conditions of Kola Lapmark. In addition to December, January and February, both November and March must be included in the winter, and the spring must be extended to the end of June. The real summer therefore consists only of July and August, and the autumn of September and October. In Murman, the first spring month, April, is still comparatively cold. The temperature scarcely rises above freezing point during the day, and rain and snow-storms are usual. In west Murman however, the progress of spring can be noted. The first migratory birds arrive, and the fishing season begins. On the other hand, it is still full winter in the neighbourhood of Sviatoinos. Only the appearance of seals on the coast suggests that the warm season is approaching. In May the temperature in West Murman rises at midday to 10°—15° Centigrade (50°—60° Fahrenheit), but generally sinks below freezing point at night. Towards the end of the month the inland waters get free of ice, the surface of the tundras thaws, the sunny slopes turn green, and the leaves on the trees come out. It is spring in East Murman. In June, the sunshine for twenty-four hours in the day would certainly cause the temperature to rise so high that one could say high summer had begun, if it were not that the breaking up of the White Sea ice at that season causes a fall of temperature, fog, and sleet. In the real summer months of July and August the surface of the tundras thaws to a depth of a yard or more. Ice or frozen ground is however still to be found in the great peat knolls on fen or shore (Fig. 5), for which reason the Lapps use these for the storage of their foodstuffs. In August the young birds are able to fly, the berries are ripe, toadstools appear, the fish, and with them the fishing, move to East Murman. The summer is coldest on the Ter Coast, where the mean temperature, at Sosnovets for example, is more than two degrees Centigrade lower than at Ponoï, which is scarcely 15 km. from the coast. In the beginning of September the trees lose their leaves, the birds of passage depart, the fishermen return from the coasts of the White Sea to their native villages. At the end of the month, after the severe equinoctial gales, the first snow may fall, but will immediately melt again. The day-time temperature does not sink below freezing until October, and then a covering of ice appears on the marshes and less rapid rivers. In November the winter begins. Sleighing between Archangel and the town of Kola, however, only becomes possible in December.

J. G. GRANÖ.

7. Vegetation.

The vegetation of the Kola Peninsula consists of the same elements as mark the flora of the Fennoscandian Peninsula in general. It can show most of the species both of the northern pine-forest region, and of the Arctic and Alpine regions. The position of the territory in the extreme east of Fennoscandia gives it, however, a not inconsiderable access of plants which are native to the more northerly districts of European Russia and Siberia, but not found further west. It has therefore a wealth of rare species which has long made the peninsula known to botanists.

The Kola Peninsula is intersected by the Arctic limit of pine forest, which has an important effect on the character of the landscape. Roughly speaking, this line runs in a south-easterly direction from the town of Kola to the mouth of the river Danilovka. Thus two-thirds of the whole territory is covered with continuous pine-forest, while the rest falls within the Arctic birch or tundra regions.

In the *Pine-forest area*, the fir is unquestionably the chief forest tree. Extensive areas are covered with fir forests of a type known in northern Finland, with an undergrowth of abundant mosses (*Hylocomium proliferum* and *parietinum*) and low scrub, which is chiefly whortleberry. The following may be mentioned as being the most important of these fir-forest areas; — the banks of the lower Nuortijok and Nuortijärvi, and their neighbourhood, the country round southern Imandra, and its banks below Umptek, the country north of Umpjaur around Lujaur-urt and the lakes of Lusmjaur and Lujaur, round the Varzuga river, and round the upper course of the Ponoï. The firs in these northern regions grow considerably more slowly than in southern and central Finland, but in favourable positions they attain a gigantic size. Fifteen to eighteen metres is stated to be a usual height in the Nuortijärvi district, and twenty five metres exceptional. At Tchapoma in the south-east of the territory, where conditions are not quite so favourable, they attain a height of 12—15 metres. Towards the forest limit the fir forests become more sparse, and gradually die away (Fig. 9). Firs occur however as single trees or creeping bushes far north of the pine forest region, and seem to vie with the birch in hardiness. Apparently, the most northerly fir tree grows on the northern shore of the island of Shalin, to the west of the mouth of the Kola Fjord. Generally speaking, the fir marks the limit of the pine-forest region eastwards of Petchenga, that is to say in the greater portion of the territory.

The *pine* is by no means so widespread as the fir. Unmixed pine can only exist on favourable ground, and never occurs except on dry gravel or sand.

The underwood is then mostly of a heathy nature with abundant reindeer moss and scrub consisting chiefly of crowberry (*empetrum*) and cowberry (*vaccinium vitis-idaea*). The finest pine forests are said to be round the upper course of the Nuortijok, on lake Mutkajärvi east of Nuortijärvi, north of Imandra round the Pietsjok and lake Pietsjaur, round Kandalaks, and in some places on the upper course of the Ponoï, such as on the Jeljok. In these districts the pine timber reaches satisfactory dimensions (Fig. 9). Dense pine woods occur here and there quite near the limit of forestation, as at Kurop-tjevsk, north of the middle reaches of the Ponoï. There pine trees can attain a height of nine to eleven metres, while further east, on the Jügjok, pines 90 years old are 7 metres high and 13—15 centimetres in diameter, while those 300 years old are 11 metres high and 30—40 centimetres in diameter. The pine seldom becomes a creeping shrub, but solitary examples are still to be found in the neighbourhood of Alexandrovsk. In the valley of the Patsjoki it extends considerably further north than the fir.

Mixed forests, especially cases in which birch has made its way among the firs, are common over the whole forest region (Fig. 10). Unmixed *birch forest* (Fig. 11) also occurs here and there, especially on the river banks, as for instance on the lower Nuortijoki, where the birches grow 10—14 metres high, with straight stems.

To the north of the limit of fir and pine forest there are tracts of varying size in which the birch is the predominant tree. This *birch region* does not extend far to the east, but it grows broader towards the west and sends out spurs along all the river valleys which debouch in the Arctic Ocean. North of the pine and fir limit the birch trees are mostly gnarled and sparse; they thrive best deep down in the river valleys and gradually die away up towards the barren tundras. The undergrowth varies much according to the soil and situation. On sheltered slopes with a favourable aspect and sufficiency of running water, the birches often form groves with a deep, luxuriant undergrowth of herbs and grasses. On level ground which is exposed to the winds, the vegetation between the scattered trunks is generally heathy, and rich in lichens, mosses (*polytrichum*), and crowberry (*empetrum*).

•The birch forest forms the natural transition to the treeless, so-called tundra-formation of the Arctic regions, which extends, except in the river valleys, over the northernmost portion of the whole territory.

The vegetation of the *tundras* is also very varied, depending on the more or less abundant supply of water, the aspect, and shelter from the wind. The dryer tundras (Fig. 12) are covered with lichen, among which either reindeer moss or the commoner species of *platysma* or *alectoria ochroleuca* are predom-

inant. Arctic species of scrub are abundant, as also various herbs and tussocky grasses. In wide stretches, however, there is no vegetation worth mentioning at all. In the moistest places the tundra becomes almost a bog. The lower layer consists partly of peat mosses (*sphagna*), but perhaps chiefly of different species of *dicranum*. Otherwise the vegetation consists principally of cotton grass (*eriphorum vaginatum*), dwarf birch and grey willow. In places with a southern aspect and protected from the winds, as for instance in water-worn valleys, there not infrequently occurs an abundance of flowering plants, which combine all the splendour of the arctic and the alpine floræ.

Vegetation of the same type occurs outside the actual tundra area on the higher mountains above the treeline. The forest on the largest fells consists mostly of fir and birch, and extends to a very varying altitude. (On Lujaururt for example, the treeline is 223—450 metres above the sea, but on Kaitunturi, west of Kandalaks, it is 470—510 metres above the sea). Among the fells on which abundant herbs and grasses flourish may be mentioned Kaitunturi, Paju-oiva, Katinkultatunturi and Riekkolatvatunturi; all west or north-west of Kandalaks.

There are also other unforested areas, besides the arctic or alpine tundras, scattered here and there within the pine and fir forest region. Heaths of considerable size occur in the east, between Sosnovets and Akjaur for example, and these, in contrast to the tundras proper, produce abundant heather. There are here, and also in many other districts, large bogs consisting chiefly of *sphagna*, with the usual types of scrub and sedge (dwarf birch, willow, *Empetrum*, *Eriophorum*, *Carex*, etc.).

Natural meadows are of frequent occurrence in the pine forest region, but are rarer towards to north. These are partly bog meadows, where sedge predominates, and partly on the banks of rivers or lakes, and at places on the coast. The most luxuriant are those on the river banks or on diluvial formations. The grass often reaches waist high, and provides the best possible fodder. The most usual species are *calamagrostis*, *diagraphis*, and *carex*. Meadows of this type are reported from the district round the lower Nuortijoki, round the upper and middle reaches of the river Ponoï, along the valleys of all the rivers which debouch on the White Sea, and also from some rivers on the coast of the Arctic Ocean, as for example the Voronie. Meadows of a somewhat different type, containing various sea-shore plants, occur at places on the coasts, especially west of Kandalaks, and in the Kola fjord, and are particularly frequent on the Rybatchi Peninsula.

Aquatic vegetation is fairly abundant in the lakes of the western part of the territory, and consists of the commoner species of *potamogeton*, *batrachium*,

etc. It gets sparser towards the east, and the numerous shallow lakes of the tundras are often practically devoid of higher plants.

Brown seaweed is the chief aquatic vegetation of the coast of the Arctic Ocean, *fucus*, *laminaria* etc., similar to that found on the Norwegian coast, though less luxuriant. On the shallow, sandy coast of the White Sea there is an abundance of grass-wrack, *zostera marina*.

Cultivated ground is rare on the Kola Peninsula. Some potatoes and turnips are grown at Kandalaks, and at Nuotjaur potatoes and barley. The vegetation of the Kola Peninsula seems to be best suited to cattle rearing. It ought to be possible not only to breed reindeer, but also to rear cattle in much larger numbers than has been done hitherto. The forests should also yield good returns if they were carefully cultivated, in spite of their relatively slow growth.

WIDAR BRENNER.

8. The Animal Kingdom.

The land animals are in the main the same in Kola Lapmark as in northern Finland. Among mammals, the bear is fairly frequent in the forest regions, as well as the lynx, glutton, wolf, fox, marten, weasel and otter. The arctic fox has lately become rare. The more valuable fur animals, such as the sable and beaver, have long been exterminated. The former were caught during the nineteenth century near the town of Kola and the last beavers were shot half a century ago in the neighbourhood of Tuloma. The elk occurs in the forests of Imandra and on the Varzuga, and the reindeer, though only in small numbers, in the interior of the country. It is certain that the Lapps, on their hunting expeditions, take more domestic reindeer who have gone wild, than real wild deer. Badgers have been found in the south-west of Kola Lapmark. The squirrel seems to be common everywhere except in Murman, the hare and lemming all over the country. The eastward migrations of the last named, from the fells of Norway and Finland to the Kola Peninsula, and thence back again, have been observed even in the last few decades. Among the forest birds may be mentioned the hazel-hen, capercaillie and black game. The snow-grouse and ptarmigan are common everywhere. There are very few cold-blooded terrestrial vertebrates. Wood lizards and vipers have been observed in the southernmost parts of the territory, but otherwise the common frog is the only representative of this group. Very scanty information is available as to the different kinds of fish in the waters. Salmon and salmon trout visit the fresh waters at times in the course of their wanderings, and are eagerly

caught, and it is known that pike, grayling, vendace, perch and eelpout occur in the Lappish rivers and lakes. There are few species of insects, but in warm summers there hatch out masses of gnats, mosquitoes and gadflies, to torment both man and beast.

From an economic point of view, the *marine fauna* is incomparably more important than that of the land. Many kinds of seal live near the coast (ringed seal, common seal, Greenland seal, bearded seal, and hooded seal.) Some years these appear in enormous schools off the Murman Coast, and do much damage to the fishing. Walrus have also been observed in the entrance to the White Sea. The commonest species of whale is the rorqual (*balænopterus musculus*). Among other animals in this group may be mentioned the blue whale (*balænopterus Sibbaldii*), hump-backed whale (*balænopterus boops*), the white whale (*beluga leucus*), the sword fish (*orca gladiator*), the dolphin (*delphinus acutus*) and the porpoise (*phocæna communis*).

Seabirds are very abundant. They breed in enormous colonies on the precipices and rocky slopes of the Murman Coast, so that the cliffs are absolutely covered with birds, and form «bazaars», as they are called in Murman. In these bird colonies the actual number of species is quite inconsiderable, compared with the countless numbers of individual birds. The most usual in Kola Lapmark are the gulls; — guillemot (*uria*), little auk (*mergulus*), puffin (*fratercula*), auk (*alca*), skua (*stercorarius*), pochard, garrot, the long-tailed duck, the eider duck, geese, and various ducks.

The representatives of the *gadus* family deserve first mention among the fish. These include the common cod, (*G. morrhua*), coalfish (*G. virens*), white sea cod (*G. saida*), whiting (*G. merlangus*) and haddock (*G. æglefinus*). Halibut (*hippoglossus vulgaris*) is also commonly caught, as well as different kinds of wolf-fish (*anarrhichas*), and in the White Sea especially, herring or «seld» (*culpea harengus*, *V. membras*). The capelin (*mallotus*) or sand-eel (*ammodytes*) is used as bait in the cod fishery. Chief among the fauna of the White Sea come the navaga (*gadus navaga*) and the nelma (*stедonus nelma*). The picked dog-fish (*acanthias vulgaris*) is caught in the winter in the Kola and Muotka Fjords.

There is an abundant variety of invertebrates (crustaceans, molluscs, echinoderms, etc.) The only ones of direct utility are certain edible crustaceans (*lithodes*, *pandalus*), mussels (*mytilus*) and certain lobworms (*arenicola*) and crustaceans that are used as bait. Their indirect importance is on the other hand incalculable, for most of the fish and whales live upon and are therefore dependent on them. When, for example, some decades ago, certain of the marine crustaceans (some species of *thysanoessa*, boreofauna iner-

mis, etc.) disappeared from the Murman waters owing to an unknown cause, this in itself unimportant circumstance caused the blue whales, which live upon them, to depart.

J. G. GRANÖ.

II. THE POPULATION AND SETTLEMENTS.

1. The Lapps.

Before the first dawn of history began to throw its light over the north, the Lapps had spread from central Finland and the district round Lakes Ladoga and Onega, in a few, scattered colonies, right up to Finmark and the distant coasts of the Kola Peninsula. Visible monuments of the culture they possessed in this extensive area are to be found in the clumsy stone age remains of the so-called Arctic type, which occur even as far up as Jokonga in the north-eastern corner of the Kola Peninsula. Under pressure from the vigorous peoples to the south of them, the defenceless Lappish stock had to choose between absorption by the newcomers, or gradually withdrawing further north. Their descendants are now only to be found in that in itself extensive area which is called Lapland, and even there only as small «islands» among other nationalities. Historical evidence shows, however, that the number of the Lapps has not diminished, but rather increased through the course of time, and this seems still to be the case in the Finnish, Swedish and Norwegian Lapmarks; in Kola Lapmark on the other hand there seems to be no increase and perhaps they are rather diminishing in numbers.

All the peoples with whom the Lapps have come into contact have appeared as *tax gatherers*; — first the Kvaens, whose affinity is still in doubt, the Carelians, who ruled the old Perm, or land of the Biarmians, and other Finns, the Birkarlar, who were probably also Finnish, then the Russians, the Norwegians, and finally the Swedes. The taxes were certainly at first collected very irregularly, and there were no precisely defined frontiers between the territories of the different nationalities. Presently, from the beginning of the ninth century, the mutual relations of the different states began to be regulated. The frontiers of taxation areas did not generally coincide with political frontiers. Some Lapps only paid taxes to one prince, (the Swedish Lapps, for example), but others paid to two or even three masters. It may be supposed that in this last case the Lapps were very badly off, for resistance on their part could not be thought of.

The most remarkable event in the early history of the Russian Lapps

(Fig. 13) is their conversion to Christianity. This took part for the most part in the beginning of the sixteenth century (up to A. D. 1533), through the labours of the Greek Catholic monks Feodorit Solovetskoï and «Saint» Trifon. The former of these worked among the Ter and Kola Lapps, the latter among the Muotka, Petchenga and Patsjoki Lapps. It is said that the conversion of the former Lapps was soon accomplished, owing to the fact that colonists from Novgorod were already living among them, while on the other hand there was no Russian population in the western part of Kola Lapmark until a later period. Another contributing cause was that Feodorit was not so severe against heathendom and magic as Trifon. Feodorit is said to have written a Lappish spelling book (or according to another account, a prayer book), which has, however, not been preserved to posterity. After the conversion, Kola Lapmark began to be called «White Lapland» in contradistinction to «Black Lapland» which was still heathen. The Christianity among the Lapps was, however, presumably only nominal in those times, for even today it is very superficial in Kola Lapmark. Only about twenty years ago there was a great sacrifice of reindeer in Semioistrovski in honour of the ancient gods.

One result of the introduction of Christianity was that the Lapmark was regarded as the property of the Tsar, which he could give away as he pleased, with its revenues and inhabitants. The Russians round the White Sea, the so-called «pomores», call the Lapps their «tributary peasants» (krestjane), but themselves «free fishermen». Trifon founded the Petchenga monastery as a point of support for Christianity, and Ivan the Terrible, in a letter of November 22nd, 1556, endowed it with extensive territory in western Murman, — viz. the Muotka, Litsa, Uura, Patsvik and Neiden Fjords, with the Lapps living there. Trifon got the Lapps to begin to establish themselves round Petchenga and take to a more settled mode of living. This had, however, no lasting effect. In 1589, Finnish guerilla bands destroyed the monastery, which was subsequently removed to Kola, and obtained, either from the Tsar or by purchase from the Lapps, a still more extensive territory on the Kola and Tuloma rivers. As soon as the monastery grew rich its monks began to oppress the surrounding Lapps. For example, in the year 1611, when the Danes had attacked the town of Kola and slain many Lapps, the monastery appropriated their property, although they had left heirs who were not yet of age. A complaint laid before the government brought no help, until in 1701 Peter the Great withdrew the privileges of the monastery.

The long union with Russia has necessarily left its traces among the Lapps of the Kola Peninsula. Knowledge of Russian is usual, especially among the men; a number of borrowed words have been introduced into the Lapp lan-

guage, and foreign customs have been adopted. The Russian influence is most clearly seen in the coastal districts, and is less strong in the interior, especially in the western forest area. The Russian Lapps are divided according to their language into two main groups; (1) Tuloma Lapps (Suonikylä, Nuortijärvi, Patsjoki, Petchenga, Muotka) and (2) Kola Lapps, who live in (a) Akkala and Imandra, (b) Kildin (the Kola Fjord, Lovosero, Voroninski, Liavosero) and (c) the Ter Coast (Jokonga, Lumbovski, Ponoï, Kamenski, Kuropteyevsk, Sosnovets).

In addition to these Greek Catholic Lapps, who are usually called »skolts» there are in Kola Lapmark and West Murman a number of Lutheran Lapps who have migrated thither from Finmark and Enare. These mostly live in the neighbourhood of Muotka, and are generally reindeer breeders. The Russians call them »filmans».

2. The Finns.

The first contact between the Finns and the Lapps was of a hostile nature. The best known conflicts took place in the years 1589—91, when dwellings were destroyed on the coast of the Arctic Ocean and the White Sea, and Russian, Carelian and Lappish inhabitants were slain. The memories of these times are still preserved by the Lapps in legends about the fighting. In the middle of the nineteenth century the Finns began to take an important part in the settlement of the Murman Coast. The famine years of the eighteenth-sixties forced the inhabitants of the province of Uleåborg, in particular, to migrate from their homes in large bodies, and to seek a living somewhere else. A number of families removed to Kola Lapmark, where the possibilities of a livelihood were already known from earlier fishing expeditions. In 1864 the governor of Archangel sent a certain Amon to enquire into the conditions of these newcomers. Their numbers were then counted to be something over 100 persons, in nine Finnish, 8 Norwegian and 3 Swedish families. Amon found their economic conditions quite satisfactory, but remarked that it would be better for them to live less scattered, as they could then send their children to school, and possibly obtain a pastor of their own faith. They would also be better able to defend themselves against foreign trappers, who made their way to the Arctic Ocean in large numbers. He suggested Uura as a place of settlement for them. The Russian government was ardent for the settlement of Murman, and tried to do what it could to assist the matter, and in November 1868 an imperial decree in nine paragraphs was published, which



Fig. 12. Tundra Landscape in Northernmost Kola. Lichen-covered Moor with Birch Bushes and Dwarf Birches in the Neighbourhood of Lake Ryhpjaur.

Photo J. A. Palmén.



Fig. 13. Kola Lapps from the Neighbourhood of Lake Lujaur.

Photo J. A. Palmén.

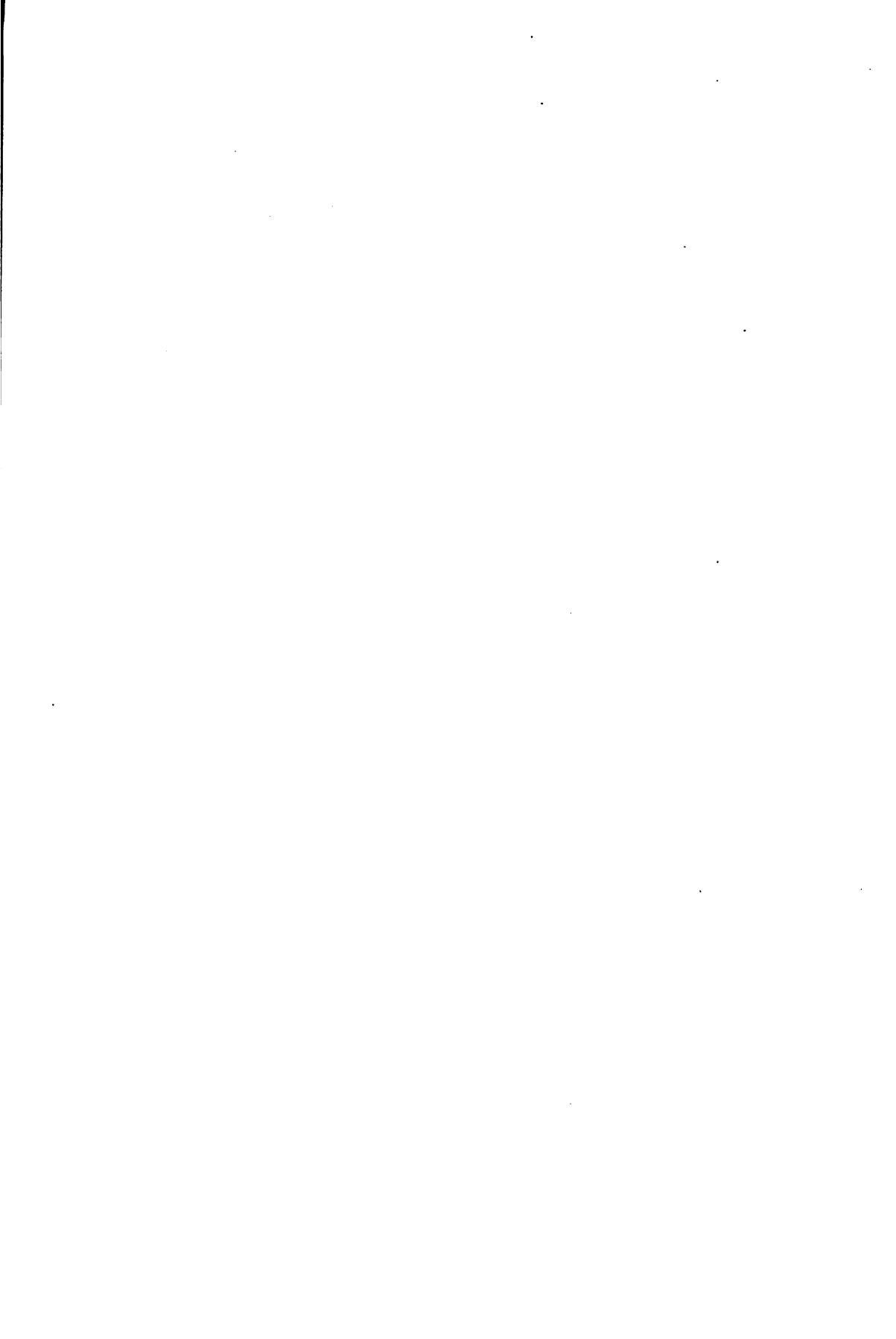




Fig. 14. Town of Kola and Mouth of the Kola River.

Photo *J. A. Palmén.*



Fig. 15. Fishing Village of Ponoï on the Ponoï River.

Photo *W. Ramsay.*



promised special advantages to the settlers in Murman. Its most important clauses were the following:

(a) For six years after the issue of the decree the colonists may carry on every kind of trade and occupation without paying taxes, and may import free of duty all kinds of industrial products and other unprohibited goods, both for their own use and for sale among the settlers;

(b) The administration of the government may grant loans of 50—100 roubles from the imperial funds for a period of six years on mortgage or other security;

(c) The settlers have the right both to buy and to borrow seed from the imperial stores;

(d) The settlers have the right to hunt furred animals and birds, and to fish in the neighbouring waters and rivers;

(e) They are released

from the obligation of using stamped paper, and from having soldiers billeted upon them, for six years,

from military service for three conscription terms, calculated from the time of migration,

from taxes and levies for nine years, reckoned from the time of migration, and

(f) The settlers have the right to make all their applications to the administration of the government in the Finnish or Norwegian languages.

A weak point in the ordinance was that it contained no provisions regarding the rights of property in land and forests, the next most important after the fishing rights. If it was the intention to introduce here the same conditions as prevailed in Russia, where the forests belonged to the state (a certain quantity of timber and fuel being allotted to the settlers yearly), those conditions were quite unsuited to the Finns, who argued that the farm included full rights of property in both forest and other land. The ownership of meadow land was in practice indefinite, for it was taken by the first comer, and this gave rise to constant disputes. Another flaw in the decree was that it made no church or school arrangements, which the colonists were obviously too poor to make for themselves. The Finns, remarkably enough, considered that this responsibility lay not with Russia but with Finland. This lack was to some extent supplied, owing to the fact that a large number of the settlers were Lestadians, and had their own preachers and teachers. Further west, the inhabitants relied on the services of pastors from Norway. A general complaint at first was that there prevailed on the coast a state of semi-lawlessness, resulting in insecurity of life and property.

The decree of 1868 mentions the administration of justice with the utmost brevity. Its last paragraph provides: »As the ordinance of February 19th 1861 charged the governor of Archangel with the duty of providing for the administration of justice in the settlements, it is also for him to provide separate legal administration for the settlers and for the Lapps.» In consequence of this another volost was established in Western Murman (between the Kola Fjord and Finmark), the administration of which was entrusted to a foreman (starshin) and a clerk (pisar). More important legal matters were decided by the proper justice of the peace (mirovoi).

One great disadvantage to the settlers was the free spirit trade; rum, in particular, was obtained from Norway, and sold in large quantities, both by the immigrants and by merchants. The unsatisfactory state of things during the first decades is shown by the fact that at times there was a very considerable emigration from Murman to America. Thus in the year 1882 the number of emigrants was sixty to seventy or one twelfth of the whole number of inhabitants. Happily, the desire to emigrate afterwards disappeared, so that the numbers of the Finns increased considerably.

The decree of 1868 was supplemented in 1876 and subsequently. The law of December 28th 1890 establishes the following rights; (1) every family settled or settling on the Murman Coast and under the protection of the governor's office has the right to obtain a loan of 50—150 roubles, free of interest, to be repaid within six years; (2) every family arriving on the Murman coast can obtain a building grant of 100—200 roubles for the purchase of timber, which is to be repaid within six years.

The oldest Finnish colonies are Pummanki (Zemlianaia) and Uura. The former was of old a centre for those who went to fish in the Russian portion of the Arctic Ocean. By degrees Finns have spread over the whole territory; to the Patsjoki (there is an important settlement on its lower course, at Salmijärvi), Filmanskoie, Stolbova, Petchenga, Muotka, Pummanki, Kervano, Vaida-guba, Supuska, Tsypnavolok, Litsa, Kakkari, the Kassi Fjord, Aara, Uura, the Saani Fjord, Kildin, the Saita Fjord, and many places on the Kola Fjord, such as Toros-ostrov, Tyyvä, Titovka, Salnij, Vajenga, Bielokamensk and Alexandrovsk. They are also found scattered over the interior on the lower course of the river Tuloma, at Niva on Nuortijärvi, in Suonikylä, and Akkala in Juomi. On the other hand, they have not settled in Eastern Murman, except in Teriberka. The chief occupation of the coast settlers is naturally sea-fishing, especially for cod. They also generally rear cattle as well, for there is no lack of pasture. Many make a supplementary income by a little trading, for which there are good opportunities, as the import of

wares is free of duty. In addition to the sea-fishing, the inhabitants on the Kola Fjord catch salmon in the early summer; most of the fishing places on the western shore belong to the settlers, while those on the east shore belong to the Lapps, and are divided out by lot for three years at a time. The chief occupation in the interior is cattle rearing, for which the extensive, grassy shores of the rivers and lakes offer excellent opportunities. Potatoes and root-crops are grown, though to no great extent. The Finns in the Patsjoki valley constantly go over to Norway, to work in the mines at Kirknæs; wandering Finnish timber-floaters are found as forest workers all over the forest regions of Kola Lapmark.

The interior of Lapmark would certainly have been much more thickly populated if the Russian government had not recently been afraid that that area would become Finnish, and not only refused to Finnish subjects the right to found new settlements, but even begun to evict earlier settlers; some of them were even regarded as vagabonds, because they had not got the necessary permits. The Russian peasants on the other hand have evinced neither the wish nor the power to colonise these forest districts.

3. The Russians.

Following in the wake of the Novgorod tax-gatherers, Russian fishermen began to make their way to Lapmark at a comparatively early period, and some of them settled down and stayed there. Russian sources mention Kola (Fig. 14) as a fishing place as early as 1263, and Ter even in 1216, when the Russian taxgatherer living there was murdered. The other settlements, such as Kandalaks, Porja-guba and Ponoï (Fig. 15) are of a later period, the end of the fifteenth century. The route to Lapmark most used by the Russians went over the White Sea to Kandalaks, and along Imandra to Kola. During the twelfth century, parties of fishermen were sent from Novgorod to the Arctic Ocean and the White Sea, with a monopoly of the Ter Coast. The foreign northern races and the Novgorodians had, until the foundation of the Solovets monastery, fishing places on the island of Solovets in the White Sea, which they visited in the summer, but left for the winter.

Towards the end of the thirteenth century, the Tartar invasion caused a wave of migration northward. Thus people removed to Trinnis (at the mouth of the Ponoï), where they coalesced with the Lapps, and some also to Finmark, e. g. to Malangen (south of Tromsö). It is said that within seven years, 1271—1278, there were no less than 196 raiding expeditions to Finmark and Halogaland, which caused a dispersion of the Norwegian population there. Carelians

were probably the chief participants in these expeditions, which were repeated in the years 1302, 1316 and 1323. In the years 1323 and 1326 the northern territory of Russia was exactly defined by the delimitation of the frontiers against Sweden and Norway. The complications continued during the succeeding century. In 1415 the Norwegians made a plundering expedition to the entrance to the White Sea, and the valley of the Varzuga, while in 1420 the Russians replied by an attack in revenge on Finmark and Halogaland, which had such success that Russians settled there for long periods, and in 1456 a part of the former population was converted to the Greek Catholic faith. The Norwegians living on the Kola Fjord were thrust out, and Carelians fell on the western parts of Russian Lapmark, and absorbed a number of Lapps. Peace was concluded between the belligerents in the year 1493.

Danish chronicles relate that the Murman Coast was twice settled in the thirteenth to fifteenth centuries, but then abandoned again owing to bad fishing years. The legends of this period mention a pirate named Anikij (of unknown nationality, according to Friis' conjecture a Dutch merchant named A. Neich); he is said to have exacted tribute from the fishermen of Tsyp-navolok for a long time, until he was slain by the son of a boyar. It is possible that Petchenga, which has been at times a place of exile for criminals, was first settled during the same centuries. It is probable that Kola and the rest of the coast was at that time uninhabited, but soon resettled, when better times came. There seems to have been a monastery at the end of the Peisen Fjord (called in later descriptions »lower Petchenga»), which, however, was destroyed early in the following century. The evidence is found in Danish sources, and also in the Tsars' letters (August 1585 and March 1586), which in order to prove that Lapmark belonged of old to Russia, mention the existence of the Petchenga monastery a hundred years previously. Axel Magnus even gives the year of the monastery's foundation, 1475, and the name of its founder, Tushan. Feodorit built the Kola monastery between the years 1530 and 1540, but he left it shortly afterwards, having quarrelled with the monks, after which only some servants of the monastery remained. Trifon refounded the Petchenga monastery soon after 1550, probably on its present site on the Peisen river, about thirty kilometres above the place where that river runs into the Peisen Fjord. A time of great prosperity then began for Murman, which did not, however, last long. There arose a centre of Russian foreign trade, with goods gathered from the Dvina, from Olonets, and from more distant places.

There was for twenty five years at the end of the sixteenth century a period of real free trade in Murman, industry developed, and people thronged thither

from round the White Sea and probably also from Finmark, which was at that time oppressed by the monopoly of the Bergen merchants. The number of monks was in 1565 fifty, and the servants of the monastery numbered 200. At the same time the monastery also got a foothold in Finmark, where it occupied the salmon-fishing place of Kiberg. Kola was fortified in 1583, and that town became the centre of administration for the district. Vaida-guba is also mentioned at this period as an important centre of trade and fishing, as well as Tsyp-navolok. English trade made its way chiefly to Archangel.

Free trade came to an end in Murman, and imperial taxes began to be levied in the year 1665, and then began the economic downfall of Kola Lapmark. The fishing was sometimes supervised by companies, sometimes by private individuals, but in either case, no one troubled about the good of the inhabitants. In the eighteenth century, the Murman fishing constantly decreased, and the Norwegian imports into the harbours on the White Sea coast increased from year to year. This was also the case in the beginning of the nineteenth century. A history of the colonisation in that period ought to mention that a group of »Old Believers» migrated to Ponoï, where they thrived so well that they by degrees completely absorbed the Lappish inhabitants.

Otherwise this Russian element in the population only appears on the south coast of the Kola Peninsula, at Kandalaks, Porja-guba, Umba, Kuzomen, Varzuga and Tetrino, and in Murman chiefly in the towns of Kola and Alexandrovsk, and to some extent in Petchenga, Gavrilovo and Rynda. The Russians have not succeeded in settling the whole stretch of coast, although their settlers had a decidedly favoured position in the matter of state support. Generally speaking, except for a few traders, the Russians form the poorest section of the population of the Kola Peninsula. In addition to the settled Russian population, mention must also be made of the very numerous migratory Russian population, which comes to Murman annually for the four fishing months.

4. Other Nationalities.

The *Norwegians* were the first people, other than the Lapps, to know the arctic coast of the Kola Peninsula. The first historic information about these regions is the account given by Ottar in A. D. 875 to king Alfred the Great of England about his journey to the land of the Biarmians. There were also armed encounters in the ninth century between Norwegians and Carelians and Kvæns in Lapland. After that time, Norwegian seamen made many trading and plundering expeditions to these regions, as for example in A. D. 918 and

1025. On these maritime adventures they harried and levied tribute from the inhabitants of the interior of the country. The Vikings even had fortresses on the coast of both Finmark and the Kola Peninsula, for example at Trinnis, in the Ponoï region, as has been mentioned. Although in the eleventh century the Lyngen Fjord was declared to be the boundary between Norway and Novgorod, the Norwegians continued to levy tribute on the Kola Peninsula as far as the Ter Coast right up to the beginning of the seventeenth century. A settled Norwegian colony existed in the west of the Kola Peninsula in the fifteenth century, for it is recorded that the Russians had then driven it from the Kola Fjord. The Russian colony diminished in the year 1665, and from that time the Murman fishing industry began to decline, remaining crippled until the middle of the nineteenth century, and throughout this period western Murman was, from the point of view of trade, in the Norwegian sphere of interest. Norwegian colonists began to migrate thither in the eighteen-fifties, and towards the end of the nineteenth century their numbers reached a couple of hundred. They lived chiefly in Kervanto, Vaidaguba, Tsyppavolok, and on Kildin, carrying on sea-fishing, and to some extent also cattle rearing and trade. There are now only a few Norwegian families left in Murman. The unfriendly attitude of the Russian authorities has made it difficult for them to remain there.

The *Carelians* levied tribute from the Lapps of old and continued to do so even after they came under the rule of Novgorod. It is probable that they took a considerable part in the colonisation of the Kola Peninsula, side by side with the Russians, whose annals do not generally mention them separately. It has already been stated that the Carelians settled down in Kola Lapmark in the fifteenth century, and that some of the Lapps coalesced with them. They have always taken part in the Murman fishery in large numbers. Some hundreds of Carelian settlers are to be found in Kandalaks in the south, and in Petchenga and Gavrilovo in the north.

It must finally be mentioned that in the last decades of the nineteenth century Zirianians migrated thither from the Izhma, a tributary of the Petchora, as well as a number of Samoyeds. The latter breed reindeer on a large scale, and in spite of their small numbers are the owners of a large proportion of the reindeer in the territory. There are some tens of families of Zirianians, chiefly living in Lovozersk in the centre of the Kola Peninsula. They are a very vigorous people, and will certainly preserve their native characteristics.

T. ITKONEN.

5. Statistics of Population.}

In 1897 there were in the Province of Alexandrovsk (then called Kola) 9,291 inhabitants. Of these 5,865 (63 %) were Russians, 1,724 (18 %) Lapps, 1,056 (12 %) Finns, 256 (2.5 %) Carelians, 117 (1.3 %) Zirianians, 25 Samoyeds and 248 other nationalities (more than 200 of these Norwegians).

No detailed census of the whole province has been taken since that time. In 1915 the population was estimated at 14,700 persons, 12,700 in rural areas and 2,000 in the towns. The density of population would thus be only 0.1 per square kilometre. — The number of the Lapps, which amounted in 1906 to 1,797, was estimated in 1802 at 1,793, in 1880 at 1,749, in 1889 at 1,763 and in 1900 at 1,834 persons.

A statistical expedition under Romanov and Rosanov was at work on the Murman Coast in 1899. Information obtained by them gave the population in that year as 460 in East Murman, 261 round the Kola Fjord (excluding the two towns), and 1,405 in West Murman, a total of 2,156 inhabitants on the Arctic coast. This population was divided into 40 settlements, of which 30 contained less than 10 homesteads, and only 5 more than 20. About half of the whole population of Murman (50.9 %) lived in these larger settlements. There were three settlements of more than 40 homesteads, namely Teriberka in East Murman, and Uura and Petchenga in West Murman. The various nationalities, reckoned in families, were as follows:

	East Murman	Kola Fjord	West Murman	Total Families
Finns	1 (1.0 %)	44 (71.0 %)	139 (50.5 %)	184 (41.9 %)
Carelians	21 (20.6 %)	1 (1.8 %)	54 (19.6 %)	76 (17.4 %)
Lapps	2 (1.9 %)	3 (4.9 %)	17 (6.2 %)	22 (5.0 %)
Norwegians	—	5 (8.0 %)	27 (9.8 %)	32 (7.3 %)
Russians	77 (75.5 %)	8 (12.9 %)	34 (12.4 %)	119 (27.1 %)
Other Nationalities	1 (1.0 %)	1 (1.6 %)	4 (1.5 %)	6 (1.3 %)
Total	102	62	275	439

There were 1,073 men and 1,083 women in the Murman population in the year 1899, or 100.9 women to 100 men. Women formed the largest proportion in West Murman, where there were 104 women to 100 men, and the smallest in the settlements on the Kola Fjord (only 93.6 women to 100 men). The average number of persons in a family was 4.9 (2.44 males and 2.46 females). The average was largest in West Murman (5.2), and least in East Murman (4.3).

The *distribution of the population* over the different parts of the Murman Coast was, according to a calculation made in 1914, as follows:

	East Murman	Kola Fjord	West Murman	Total
Settlements . . .	14	15	28	57
Homesteads . . .	218	69	314	601
Inhabitants . . .	1,014	332	1,836	3,182

Thus, in the course of fifteen years the settled population of Murman had increased from 2,156 to 3,182, or by about 1,000 persons, — that is to say by nearly half the number of the total population in 1899. These figures do not include the fishermen who visit Murman in the summer, and generally number 2,500—3,000.

In the *Patsjoki* (Pasvik) district there were in 1899 living on Russian territory 210 persons, 107 males and 103 females. These formed 34 families, 25 Finnish and 9 Lappish, thus making an average of 6.2 persons per family, or considerably more than on the Murman Coast.

According to investigations made on the spot by W. Olin and T. Itkonen, the present (1918) population of West Murman seems to amount to about 1,900 persons, of whom about 1,300 (68.5%) are Finns, about 250 (13.1%) Lapps, about 25 Zirianians, 5 Norwegians and 320 (16.8%) Russians. About 400 persons live round the Kola Fjord, 295 (74%) Finns, 5 Lapps, and about 100 (25%) Russians, while in the area of the rivers Pasvik (*Patsjoki*) and Peisen or Petchenga (*Petsamojoki*), there are about 565 inhabitants, 200 (36%) Finns, 290 (51%) Lapps, and 75 (13%) Russians. Thus, this portion of Kola Lapmark would contain in all about 2,865 persons, of whom the Finns form about 1,795 (62.8%), the Lapps about 545 (19%), the Zirianians 25, the Norwegians 5 and the Russians about 495 (17.3%).

The total population of the coast villages of the *Ter and Kandalaks Coasts* (including *Kolvitsa* and *Kandalaks*), amounted in 1910 to 5,893 persons. Out of this total, 524 lived in the volost of *Ponoi*, 1,390 in *Tetrino*, 2,397 in *Kuzomen*, 881 in *Umba*, and in the part of the volost of *Kandalaks* belonging to *Kola Lapmark*, 701. The largest centres of population were *Varzuga* with 1,001 inhabitants, *Kuzomen* with 780, *Kandalaks* with 596, *Umba* with 541 and *Tetrino* with 455. The great majority of the population were of Russian nationality. In the year in question Lapps were chiefly to be found in the volost of *Ponoi*, where they amounted to 350 souls, and *Carelians* in *Kolvitsa*, 105.



Fig. 16. Potsonkuja Fell Hut, Nineteen Kilometres South of the Town of Kola.

Photo *J. A. Palmén.*



Fig. 17. Going out to Fish, from the Village of Ponoï. September 15th 1887.

Photo *J. A. Palmén.*



The central and western *interior*, the Lapp volost of Kola, contained in 1910 1,997 inhabitants. 30 of these were Finns (7 in Hulkkola and Luttojoki and 23 in Kuhala on the Juonnijoki), while the rest were Lapps 1,766, Russians 159, and Zirianians and Samoyeds 42 souls.

There are no trustworthy statistics of the *town population* of recent years. Since the construction of the Murman railway there are supposed to be at present about 1,000 inhabitants in Kola and about 600 in Alexandrovsk. The latter town was founded in 1899, and has grown slowly. Kola is one of the oldest towns in Russia, mentioned as a fishing place as early as 1263 (see above), and was formerly the capital of the province. At times in the past it has had a larger population. There are no statistics of the population of the newly founded Murmansk, or — as it was at first called — Romanovna Murmane.

According to the *ecclesiastical statistics*, the birthrate in the Greek Catholic population in the district of Alexandrovsk was 33 per thousand in the year 1899, and five years later, in 1904, was 38 per thousand. The death rate for the same years was respectively 20 and 30 per thousand so that the increase of population was 13 and 8 per thousand in the two years respectively. The smallest natural increase took place among the Lapps. According to Kopanski their annual increase in West Murman is 18 per thousand and in East Murman 7 per thousand.

J. G. GRANÖ.

III. MEANS OF COMMUNICATION.

Steamboats and small vessels ply on the Murman Coast all the year round. During the summer, from the end of May till the middle of September, when fishing is everywhere in progress, the steamships of the Murman company which ply between Archangel and Vardö put in once a week (two vessels in turn) at every fishing place of importance from Alexandrovsk eastwards. Traffic on the west coast is similarly served once a week by a smaller vessel belonging to the same company. During the winter a vessel plies once a month along the whole Murman Coast, but in case of gales or fog it does not put in to all the stations, omitting chiefly those where anchorage is dangerous or inconvenient. The sea-traffic is protected by *life-saving stations*, *life-boats* and *lighthouses*. The last-named have been put up in a number of places, three on the Ter Coast and 14 on the Murman.

The interior of the Kola Peninsula proper is fairly deserted in the summer,

as the inhabitants from most of the villages move to the coast to fish. Waterways are therefore of no great importance as lines of traffic, especially as the rivers are made difficult by rapids near their mouths, and are hard to navigate. The most important of them are the Ponoï and the Varzuga. Conditions are different in the west of Kola Lapmark, for there the settled population of the interior makes its way during the summer to the numerous small lakes. There are here three main routes, namely (1) the Imandra water-system which flows out at Kandalaks; this is only divided by a narrow neck of land from the Kola river, which connects with the Kola Fjord and with a water system stretching westwards right to the Finnish frontier. (2) The water system of the Tuloma river, which flows out in the Kola Fjord. This includes the long lake of Nuortijärvi, and the rivers Luttojoki and Nuortijoki, which rise in Finnish territory, and are navigable though they form many rapids. (3) the river Pasvik (Patsjoki), which flows out in the Varanger Fjord and is used by a number of the inhabitants of Enare as a trade route to Norway. The navigation of this river is much assisted by the rollers which have been constructed in three places on the Norwegian side, beside the largest rapids. On all these waterways there is a very cheap *boat posting system*, compulsorily worked by the Lapps, which has been established for the use of the Russian officials.

The land traffic routes are soon enumerated. A *high road* has been marked out from Petchenga to Enare; it was under construction in the years 1915—16, much the greatest part of it at the expense of the Finnish state, but it was then abandoned, so that long stretches of it are now impracticable. There is a «good road» from Trifonnieme to the Petchenga monastery. There is a kind of ditched *bridle path* from Kola to Kandalaks, but the most important is naturally the *railway* from Kandalaks to Alexandrovsk, which has lately been completed. There are no roads at all in the rest of Kola Lapmark. There are only *paths* stretching between the different dwelling places, and not always even these. Traffic is livelier in the winter, and proceeds along *winter roads*, which have been drawn over suitable surfaces, generally rivers, lakes and bogs, and are kept open by those who travel with reindeer caravans. A posting system has been established for the use of the officials, with stations in the coastal area at Gavrilovo, Pummanki (Bumansfjord) and Petchenga, in the interior at Kola, in the pogost of Kildin, at Nuortijärvi, Kitsa, Pulosersk, Lovosersk, Liavosersk, Semioistrovsk, Jagelnyibor, Zasheika, Muotka and Pasvik. Where there are long distances of 100 versts or more, solitary «mountain huts» (Fig. 16) have been established for travellers, e. g. between Alexandrovsk and Kola and between Kildin and Teriberka.

There is *telegraphic communication* from Kem to Kandalaks and thence on to the town of Kola, from Kandalaks via Umba to Kuzomen, and in Murman from Kola eastwards via Teriberka to Rynda and East Litsa, via Alexandrovsk to the Rybatchi Peninsula and Petchenga, and finally from Alexandrovsk via Petchenga, Ivalo and Rovaniemi to Petersburg. There is *telephonic communication* between Enare and Petchenga, between the latter place and Vuorema or Gränsjakobsälvi on the one side and thence on to Finmark, and on the other side to Kola and Alexandrovsk. There are also telephone lines from several fishing places and lighthouses to the nearest telegraph station, for giving information about the fish. There are *post offices* in all the larger settlements and villages on the telegraph lines.

T. ITKONEN and J. G. GRANÖ.

IV. ECONOMIC LIFE.

I. Husbandry.

The climatic conditions in Kola Lapmark are not favourable to *agriculture*, for which reason there is exceedingly little tilled ground. Barley is the only grain that grows, and even that only to a limited extent in the western part of the territory. The Finns have grown this grain on the Pasvik river for nearly half a century. The sowing takes place in the beginning of June, and the crop — which occasionally yields a tenfold return — is harvested in the end of August. *Potatoes* are grown in most of the settlements in the interior, here and there in Murman, and on the coast of Kandalaks. The highest yield in the valley of the Pasvik is eight or ninefold, in Uura, in West Murman, five or sixfold. In East Murman potato growing does not pay. The frost often does damage, and the tubers are stunted, »like peas». Turnips do better, often attain the size of a saucer in East Murman, and are very tasty. Gardening in general, and at least turnip growing, ought to be possible all over Murman except in the extreme north, and far to the east. In favourable years not only potatoes and turnips can be grown in West Murman, but also onions, swedes, black radishes, radishes, lettuce and parsley, and even green peas.

Cattle-rearing pays better than agriculture. For natural reasons, reindeer are most generally kept. There are large numbers of sheep. In the most westerly parts of Kola Lapmark, where the river valleys afford good feeding grounds, cattle are also kept. Cows even can be seen grazing on the barren rocky shores, where green meadows only nominally exist. The fodder is supplemented by lichen, seaweed, cods' heads and willow leaves. Horses are kept to a

lesser extent, as their usefulness does not correspond to their cost in these regions where there are few roads and little hay. The breeding of pigs and goats is exceptional. There were in 1908 in the Province of Alexandrovsk a total of 132 horses, 1,952 cattle, 67,638 reindeer and 4,628 sheep. Information collected in the year 1899 states that there were then on the Murman Coast, excluding the towns of Kola and Alexandrovsk and the Petchenga monastery, 10 horses, (most of them on the Rybatchi Peninsula), 714½ cattle (young animals under one year being counted as a half), 580 of them being in West Murman, 3,147 reindeer (1,809½ in West Murman), 1,461 sheep (1,082 in West Murman), 11 goats (on the Kola Fjord), 6 pigs (in Tsypnavolok and on Kildin) and a few hens (in Tsypnavolok). In the same year the Finns living on the Pasvik river had 4 horses, 90 cattle, 114 reindeer and 74 sheep. 1,834.6 tons of hay were harvested in the whole district in the year 1905.

2. Fishing.

Fishing is the most important means of livelihood in Kola Lapmark. The chief hauls in the Murman waters, which are influenced by the Gulf Stream, are cod, halibut and sea-cat. On the White Sea coast salmon, herring and navaga are caught, and in the interior chiefly salmon. The Murman cod-fishery is sea-fishing which demands sea-worthy vessels, comparatively expensive tackle, and the labour of at least 3—4 persons. The fishing on the Ter and Kandalaks Coasts and in the interior, on the other hand, can be carried on by those who are less well off, and by single individuals, even women or children. (Fig. 17). Thus the Murman fishery is sharply distinguished from the fishery in the other parts of Kola Lapmark.

Cod first appear early in the spring in the Varanger Fjord, and then slowly make their way eastwards. It is the movements of this fish which make spring the most important fishing time in West Murman, while in East Murman it is the summer and autumn. The spring fishers («veshniaki») make their way as early as March, before travelling gets bad, from Kandalaks across the Kola Peninsula to Murman. The settlers living on the Arctic coast join them, and they sail further eastwards in boats. The most important fishing grounds for the spring fishing are situated outside the Rybatchi Peninsula. The fish generally leave West Murman in the end of June, and by the beginning of July the summer fishing in East Murman is in full swing. The summer fishers («letniaki») arrive by sea shortly before that time, from the coasts of the White Sea, and settle down at the fishing places, especially those situated in the Kola Fjord.

The organisation of the Murman fishery has until quite recently been purely capitalistic. The capital necessary to pay the boat's crew and fishermen, as well as the boat and tackle, belong to one individual, the master, who often takes no part in the work at all. The other members of the party sink nothing in the enterprise except their labour power. The much described and debated relationship between employer and workers which thus arises in Murman and the White Sea is called «pokrut», and usually takes the following form: the master takes $\frac{1}{8}$ of the catch, and $\frac{1}{8}$ is divided among the four members of the crew, each one of them thus receiving $\frac{1}{32}$ of the catch. This share of the takings is estimated to average 60—80 roubles, but is sometimes as little as 35—40 roubles. The mate receives half a share — $\frac{1}{24}$ of the total catch — in addition, and a money wage, «svershonok», the amount of which, usually about 50 roubles, depends on his skill.

Some years ago, when spirits were not yet prohibited in Murman, and the government did not assist fishermen who wanted to get on, the pokrut organisation was general. The agreements were signed early in the winter. The employer, who was in most cases some trader, then paid a proportion of the wages in kind (clothing, tea, flour, etc.) in advance. As soon as the men reached Murman in the spring, the rest of the wage went speedily in gin and Norwegian rum, which was obtainable in abundance at all the fishing places. The result was that the fishermen had to have recourse to credit even before they went home. The burden of debt grew from year to year; the dependence on the creditors almost amounted to slavery.

The vessel used for the Murman fishery is most usually an open capacious boat, «shniaka», with two pairs of oars and a rectangular sail, of about 3,000—5,000 kilogrammes (about 3—5 tons) burden. Norwegian yawls are used to a lesser extent, and only the wealthier people own expensive, decked vessels. There were in 1913 altogether 1,116 vessels in Murman, 80% of them being open «shniakas» and yawls. There were very few motor boats, such as are now in general use in Norway. The most usual kind of fishing tackle is a sort of long-line, «jarus». It is composed of a certain number (at most 40) of strong lines, 180 fathoms long and as thick as a pencil, on which hooks are fastened by short snoods. The bait is capelin, launce, or failing these worms, which are fixed to the hooks, and the «jarus» is then let down into the sea and examined every six hours. The number of the crew depends on the vessel. There are usually 3 in the yawls, 4 in the «shniakas» and 5 in the decked vessels. The crew of a «shniaka» is commanded by the mate, «korshtchik». He chooses the fishing places and arranges the work. The «oarsman», «veselshtchik», rows in the bows, with the first pair of oars, while the other oars are plied, as the rest

of the work allows, by the man who draws the line, »tiaglets, and the one who puts on the bait, »nazhivlialshtchik». One of the men in the boat is often replaced by two women or half-grown boys, »polovinki». Children also take part in the work, disentangling and arranging the fishing tackle for a small sum. If it is possible to sail on the way back from the fishing grounds, the catch is cleaned on the way. The guts are thrown into the sea, the livers, used for making cod liver oil, are kept separate, as also are the tongues, which are salted, and the heads. The fish is either delivered straight to the purchaser's ship in the harbour, weighed there, and salted down in the hold, or delivered to store-houses on the shore, and salted there in barrels.

Longer and more remunerative trips can be made with the decked vessels, and it therefore pays best in the long run to keep them, in spite of their higher price. It has been calculated that during the best fishing time in the summer (July 8th—August 3rd), each member of a crew earns on an average the following sum; on yawls, 170 marks, on shniakas 270, and on decked vessels 675 marks.

The Finns and Norwegians often prefer *angling* to long-line fishing, especially when fish are very plentiful. This is done without any bait-fish, as a piece of cod entrails or of white cloth serves as bait.

The long-line takes not only the usual cod, but also haddock, various kinds of flounder, and so on, while angling catches almost exclusively cod and haddock. Coalfish are caught with a square net, which is carefully let down under the shoal of fish (in shallow water), and then raised to the surface with its spoil. This work requires four boat's crews, one for each corner of the net.

Salmon and also dog fish are caught in Murman, beside the fish above mentioned. The latter are caught on strong hooks fastened to an iron chain and baited with a piece of seal blubber. Herring are also caught.

Between the years 1898 and 1914 the lowest number of persons fishing in Murman in one year was 3,293 (in 1912), and the highest number was 4,261 (in 1900). The smallest total catch during this period was 3,223,800 kilogrammes, — in 1904, and the largest was 8,699,800 kilogrammes, — in 1913. In addition to this, 450,000—850,000 kilogrammes of cod liver oil were prepared annually. The following quantities of different fish and fish-products were exported from Murman to Archangel in the year 1913; salt cod, 2,858,680 kg., dried cod 6,650 kg., cod's heads 101,710 kg., cod liver oil, 160,130 kg., salt coalfish 76,800 kg., haddock, 818,780 kg., halibut, 29,430 kg., flounders 17,600 kg., and herring, 8,530 kg.

If the fishing on the Arctic coast were properly organised, it would cer-

tainly produce incomparably more. The present proceeds are not even sufficient for the needs of the district, for importation from Norway is growing steadily. The Murman fishery is at present obviously on the decline. For example, during the last decade 3 million kilogrammes of coalfish were caught annually on the Russian side of the Varanger Fjord and at Vaida-Guba. At present nearly all come from Norway. Neither is any attention paid to the catching of a fish so valuable and so common in West Murman as the halibut. More care and labour was formerly devoted to salting the fish. The quality of the fish-produce has also declined in course of time. In the time of Peter the Great there were specially introduced Dutch instructors working in Murman at the fish salting.

Salmon is the principal fish on the Ter Coast, and in Kandalaks herring and navaga as well. The salmon is caught by various different kinds of tackle. On the coast and at the river mouths nets are most used, and traps higher up the rivers. The fishing season begins in the beginning of June and lasts till the middle of November, with an interval of a couple of weeks in August on the eastern part of the Ter Coast. The summer salmon are smaller, averaging $1\frac{1}{2}$ —2 kg., and seldom exceeding 3 kg. The autumn fish are larger and more valuable, their weight reaching 6—7 kg.

The annual catch of salmon in Kola Lapmark averages 325,000 kg. In the year 1914 366,000 kg. were taken, 297,300 kg. of this on the Ter and Kandalaks Coasts (not including the villages of Kandalaks and Kolvitsa which belong to the province of Kem). Special attention has recently been devoted to the salting and conservation of the salmon. Some of the Murman fishers send their catches to be smoked in Norway, and a Petersburg firm has established modern cold-storage cellars at Tuloma. It may be mentioned that the abundance of salmon in Kola Lapmark has not escaped the attention of the English sportsmen. There are few summers when some of these do not visit the rapids in Tuloma and some other rivers to angle for salmon.

The herring or »seld» fishery is concentrated on the west coast of the White Sea and the inner waters of the Gulf of Kandalaks. Herring are not caught east of Kuzomen. Four different fishing seasons are distinguished. The first of these is in May, when the herring spawn. The coastal waters are then still frozen, and the nets are let down under the ice. The fish then caught, the »under-ice fish», are comparatively small and thin. Two seasons are in the summer, the »after-ice» and Ivan's season, and the fourth season is in the autumn. »Ivan's fish» are the largest, weighing 150—200 grammes, but the autumn fish are the fattest. There are no reliable statistics of the quantity of herring caught. In the year 1909 32,529 casks of herring were salted in Kandalaks,

3,500 casks in Kolvitsa, and 500 in Porja-guba. A cask is estimated to contain 8.2—10 kg. of fish, so that the whole amount, 41,029 casks, would come to between 336,200 and 410,000 kg.

The navaga fishing on the Kola coast (by winter angling) is of less importance.

Foreigners have recently begun to *trawl* on the Arctic coast off Kola, with specially constructed steam trawlers. They trawl chiefly for flounders, great quantities of which are sometimes collected on sand or clay bottoms out at sea, at a depth of 70—140 metres. This fishery is beginning to be carried on more and more indiscriminately, to the injury of the coast population. The limit of the territorial waters in Russian Lapmark has not yet been internationally settled, (an old conception was that the width of the territorial waters was the extent of a cannon's range), neither is the coast-guard service properly organised. The trawlers come chiefly from England, and partly also from Germany, Norway and Sweden, and were first seen in the Murman and Kanin waters in 1904. They generally arrive in May, and first fish off the Rybatchi Peninsula, but then move eastwards, following the movements of the cod, and in the end of September and in October work the Kaniñ and Kolguev districts. The trawlers can coal for 25—30 days. The foreigners spend at most half that time on the journeys, so that they can devote at least 10—15 days to fishing. The English boats make five or six trips during the fishing season. Each trip brings in 35—50 tons of fish, worth 7,000—27,000 marks in money. The Russians in Archangel have also begun to trawl in the last few years, but so far with little success.

The inland fishery is a very important factor in the Lappish economy. The salmon fishing has already been spoken of in connection with the coast fishing. More than half the salmon fishing in Kola Lapmark is carried on by the Lapps. As far as is known, the Tuloma river is the most productive of the waters in the territory, furnishing an average of 6,500 kg. annually for commerce. There is no reliable information about the rest of the fishery, as the statistical figures only deal with a small proportion of the catch, that which comes into commerce. It must be remembered that the Lapps live chiefly on the cheaper fish from the inland waters.

3. Sealing and Whaling.

Sealing is carried on as well as fishing on the coast of Kola Lapmark, and other sea mammals are killed occasionally also. The Murman sealing has recently increased while the fishing decreased. This is due to the greater

abundance of seal, which, also, — at least so suppose several experts — has caused the fish to migrate elsewhere.

Seal hunting proper (chiefly for Greenland seal) began in West Murman in the last decade of the nineteenth century. One year the first seals appeared off the coast of the Rybatchi Peninsula at the end of March. In the following years they came earlier and in ever increasing numbers, so that before long the sealing season began as early as the beginning of February, and lasted until the end of May. Observations made on the Rybatchi Peninsula show that these seal come from the north, and they probably come from Spitzbergen. They are fatter and clumsier than those which come from the White Sea, which have been hunted in East Murman from time immemorial. The blubber of the Spitzbergen seal sometimes comes to as much as over 80 kg., while that of the East Murman seal only reaches 35—40 kg.

The seal are generally caught in nets on the Murman Coast, and less often shot. The nets are 7—11 metres wide and 20—22 metres long, and are set at right angles to the shore at a depth of 15—25 metres. Three or four nets are often joined together in a continuous wall. The seal catch in them very easily and cannot get loose. The seal are hunted on the ice, generally in inlets where stones are uncovered at low tide. When the tide rises, holes in the ice open round these stones, and the seal come up through them on to the ice. It often happens that they do not get back into the water before the tide falls again and the stones fill the holes.

On the east coast of Kola, where there is little fish, sealing has been an important occupation from of old. In the beginning of March large herds of seal are to be seen on the ice floes which break off from the White Sea, and drift past that coast towards the Arctic Ocean. The youngest animals are seen first, then the half grown, and finally the full grown seal. The best sealing area is between Sviatoinos and the Kanin and Orlov capes. The seal catchers pass along the edge of the ice in specially constructed ships or in steamboats. When the look-out at the masthead sees a group of seal on an ice floe, the men go to meet them in several vessels from different directions, so as to cut off their retreat. The seal are either shot or killed by a blow on the head with a club. The skin and the layer of blubber are cut off and conveyed to the vessels. It is generally Greenland seal which are thus taken, less often ringed seal or bearded and hooded seal. The hunters may also occasionally obtain a walrus or a polar bear.

The seal-shooting season in the *White Sea* begins as early as December, and lasts till the middle of May. It is chiefly carried on out at sea on the east coast, and therefore beyond the limits of the territory here in question.

In the year 1908, 2,216 persons in the province of Alexandrovsk were engaged in sealing. They took 14,000 seal which were then worth 136,000 marks. Other sea mammals were also caught to a value of 54,000 marks.

Whaling in the parts of the Arctic Ocean which wash the coasts of Kola Lapmark is a thing of the past, as the more valuable kinds of whale have migrated elsewhere. Only 40 years ago this occupation was still flourishing. There were then 35 Russian and Norwegian whaling crews with special whaling ships at work between the North Cape and Sviatoinos. Special factories for working whale products were founded at Jeretik in 1882 and in the next year at the Ara Fjord. The oil was sold by preference to England, while Hamburg took the whalebone, the guano made from the bones and remnants of flesh, and the glue made from the liquid which remained in the cauldrons when the oil was prepared. The factories were closed in 1890, as the large whales had disappeared. At the same time the Norwegian factories on the Varanger Fjord, which numbered twenty, stopped working. The greater number of them, like the factory at Ara, were removed to the west coast of Norway, to Iceland, or to the islands lying to the north of England.

White whales are still occasionally caught in the White Sea, especially off Umba.

4. Hunting.

Hunting is only an occupation of the second rank, compared with the fishery and sealing. It is chiefly carried on in the forests of the interior. According to the official statistics, which naturally give values considerably lower than those of the actual quarry, hunting is most profitable in the volosts of Kuzomen and Ponoï and in Kola Lapp volost, and least profitable on the Murman coast.

1,171 fur-bearing animals were killed in all in the district of Alexandrovsk in the year 1904; these included 399 marten, 210 fox, 100 Arctic fox, 26 wolverine, 17 wolves and 14 bears. The number of hunters was 460. The value of the quarry was estimated at 16,125 marks, giving an average of 35 marks for each hunter. Four years later, in 1908, — if the statistics may be believed — the number of hunters had increased to 553, and the value of the quarry (then also chiefly martin and fox) was 40,000 marks. This gives an average earning for each hunter of 72 marks, or double as much as in 1904. Forest game (ptarmigan, hazel hen and black-game) to the value of 325 marks were brought to market in 1904, and in 1908 to the value of 2,700 marks.

5. Forestry.

Forestry is still very undeveloped. Nevertheless, owing to the poverty of the forests and the great demand for building material and fuel in the centres of population in the Arctic coastal districts, more attention has been paid to the forests than in many other parts of northern Russia, where they are still being absolutely devastated. The territory is divided into three forestry districts, — Petchenga, Kola and Kandalaks — and these in their turn are divided into eighteen demesnes or «Datcha». Information obtained from printed sources shows that at the beginning of this century there were annually sold by auction about 40,000 logs and about 5,000 cords of fir wood in the Kola district, and about 15,000 logs in the Kandalaks district. The forest resources of the Petchenga district had at that time not been estimated, so timber selling only began later. In addition, the state supplied building material and fuel for the population from the state forests at a fixed price.

The river Tuloma is the most important water way for *timber-floating* in Kola Lapmark. The greater part of the building timber used on the Murman coast is brought down by it. Occasionally the logs are brought by sea from the regions south of the Province of Kem. The timber needed for building in the town of Alexandrovsk is brought by this means from as far off as Archangel. Fuel is obtainable to some extent in the inner reaches of several fjords, where the wood is hewn in the winter, and whence it is brought in the summer by boats to its destination.

The Lapps are do not do forest work, for which either settlers living in the neighbourhood are employed, or men are brought from the province of Kem, from Finland or from the government of Vologda.

6. Industry and Mining.

There were in 1908 altogether 90 *industrial establishments* in the province of Alexandrovsk, namely 80 try works and conserving factories, two sawmills (in Umba and near the town of Kola), and one chamois-leather factory. In the year quoted these factories employed 554 persons. The value of the produce of the try works amounted to 280,000 marks, that of the sawmills to 1,100,000 marks, and that of the chamois-leather factory to 27,000 marks. In addition to this the fishermen themselves boiled blubber to a value of 32,000 marks. Sawmills have also been worked at times at Muotka, on the shore of the Gulf of Ozerko, (from the year 1899), and at the Petchenga monastery. There are now plans on foot for establishing a large sawmill near the

innermost waters of the Jar Fjord, not far from Boris-Gleb, and for constructing a railway in connection with it to the nearest harbour which is open all the year round, on the Norwegian side of the frontier at the Jar Fjord. The Petchenga monastery has a small brickyard for its own use.

Among the different branches of *handicraft and home industry*, the boat building is worth mentioning. There are several skilled boat-builders in the Finnish settlements on the Pasvik river and in West Murman. Decked vessels are built in some places, for example at Läätsi and Uura.

There is up to now no *mining* to speak of in Kola Lapmark. It is true that gold has been found in the territory (on some islands in the Gulf of Kandalaks and in the Ponoï valley, and possibly also elsewhere); silver (at places in Murman, on islands in the Gulf of Kandalaks, and near Porja-guba and Umba), copper ore (on the islands and in West Murman), lead ore (in West Murman, Kandalaks, Porja-guba, etc.), and zinc ore (on the islands in the Gulf of Kandalaks). Even diamonds have been found, though unfortunately of microscopic size, in the Pasvik river. In most cases, however, there is insufficient information as to the value of the deposits. Blasting has up to now only been undertaken to some extent in Kandalaks, and in West Murman in the Dolgaya and Bazarnaya Fjords. In the former place work was in progress as early as the years 1737-41 and 1764, under the direction of experts brought from Saxony. Altogether 750 kg. of pure silver were obtained. Lead ore was blasted in Murman for some years towards the end of last century; — 131,000 kg. in 1890 and 8,180 kg. in 1893. The ore contained in the best cases 80% of lead. The work was suspended for lack of capital, but has been resumed during the world war. These lead ores are the most promising ore deposits in Kola Lapmark, but nothing can at present be said about their real value, until the extent of the deposits has been fully investigated.

7. Subsidiary occupations.

One of the most usual subsidiary occupations of the Lapps in the interior is *mussel fishing* in the rivers, especially with a view to finding pearls. These molluscs are said to be most abundant in the rivers where salmon are plentiful, so that salmon- and mussel-fishing are generally carried on in the same waters. The great majority of the mussels, 97-98%, are valueless, containing no loose pearls, so that quite an inconsiderable collection of pearls means the destruction of a mass of mussels. Most of the pearls found in Kola Lapmark are of small value. Thus, in one collection of 108 pearls bought from Lapps, there were 26 quite valueless pearls, 35 light grey or brown, 15 light

blue, greenish or yellowish, 22 dull white, some with a tinge of grey, blue or yellow, 8 gleaming white, one very fine rose-coloured, and one gleaming steel-coloured, almost black. The smallest were the size of pins heads, and the largest as big as peas, most of them round in shape. The largest was valued at 400 marks in Petersburg, 295 marks was paid in Berlin for two of the gleaming white ones. In the year 1905 there were 154 mussel fishers at work in the sources of the Varzuga, and they found pearls to a value of 5,300 marks. It is unknown how many there were pursuing this occupation in other parts of Kola Lapmark. One result of too zealous pearl fishing is that the river mussels in Kola Lapmark are beginning to get less common.

The collection of eider down in the coastal regions could, if properly organised, become more profitable. At present this work is a source of income quite unknown to the population. The eggs are collected, and the birds killed, in spite of the fact that the eider duck is protected by law. The income thus derived is only a fraction of what the down could produce, not to speak of the fact that this treatment is driving the birds in question away from the Kola coasts on to Norwegian territory, where they are in every way protected.

It would certainly be worth while to fish for the edible blue mussel which lives in the Arctic Ocean, and is also called the «Kola oyster» (*Mytilus edulis*), and especially for the ten-footed, somewhat lobster-like crayfish (*Pandalus borealis*) which occurs in large numbers. This latter is comparatively large and very appetising; it is also useful as bait. It lives so deep down, however, that special tackle would be necessary for catching it. — Confirmation is needed for the statement to be found in print that the *sponges* which live in the gulfs on the Murman coast can easily bear comparison with the world-famous Greek sponges.

Among the vegetable products which are useful for food the *berries and funguses* must be mentioned. All kinds of berries common in northern Finland, — cowberries, blueberries, bogberries, cloudberries, crowberries — are abundant in Kola Lapmark. They often grow particularly large and full of flavour. The excellent cloudberries of the Hen Islands are specially famous, and it is said that they were in former times even sent to Moscow for the imperial court.

The occupations of the unsettled population include timber-hewing, which has already been mentioned, transport of goods and timber-floating. Posting by boat or by land is specially necessary in the valley of the Pasvik and on the straits between the islands of Utsjok and Utsjok, and in the straits between the islands of Utsjok and Utsjok, and in the straits between the islands of Utsjok and Utsjok. 270 persons were engaged in it in the year 1905. Timber-floating — chiefly in the Tuloma area — only employed

30 persons. Men only go to work in Norway from the western parts of Murman. They mostly go to Vardö, where each year from March to the end of July the loading of the Russian fish-merchants' ships is in progress. During recent years many have earned their living in the construction of the Murman railway.

One special source of income for settlers or Lapps on or near the coast is the care of property left during the winter in Murman. Owing to the absence of forest, and the poverty and small numbers of the population, the fishers are obliged to bring with them building materials or tents, foodstuffs, and other property, which it is not worth while to convey to and fro each year, but on the other hand cannot be left unprotected for the winter.

8. Trade.

The trade of Kola Lapmark chiefly consists in the export of fish and forest produce, and the import of foodstuffs — including also fish — and manufactured goods. The ports of the territory (including Kandalaks) export goods annually to the extent of 2,500 tons. The exports consist of fish, cod liver oil, whale oil and furs as well as some eider down and feathers, and also wood produce (from Murman to Norway). The imports amount to about 7,500 tons. The chief imports are flour and grain, especially rye flour, building materials and petroleum.

As to the commerce of Murman in particular, the wholesale trade there is entirely in the hands of factors. They buy up the produce on the spot, and send it, usually excepting the cod liver oil intended for other countries, to Archangel in vessels of their own or hired, and thence on to Petersburg. The larger factories are now in East Murman (Malo-Olenie, Teriberka, Gavrilovo, Triashtchino, Rynda and Harlovka). Every factory has its own wharf close to the harbour, and near by a more or less well-stocked shop, where the population buys cloth, foodstuffs, fishing tackle, etc., and even sweets, gold and silver jewellery and toys, all certainly at comparatively high prices.

In addition to the factors' general shops, there are in many places in the Murman villages specialised shops founded by settlers or tradesmen who have migrated to those places. Most summers there also come pedlars from the coasts of the White Sea, selling wooden goods, flour and grain, and buying fish produce.

In the year 1899 there were in Murman 50 shops in all, owned by 40 persons, 28 shops being in East Murman, and 22 in West Murman or on the Kola Fjord. Eight out of this number were general shops belonging to the factors:

21 were open for business all the year round, 29 only in the fishing season. There were in addition nine bakeries in East Murman, which worked mainly during the summer.

Business life was really, however, somewhat more lively than these figures show, for during the sailing season the richer settlers generally provide themselves with more goods than they need for their own use, so as to carry on trade in the winter by the side of their other occupations.

The towns of Kola and Alexandrovsk are not included in the above. They take a leading position as centres of import among the Murman places of trade. Up to now, the very ancient town of Kola has remained more important than the new Alexandrovsk, partly owing to the new railway, notwithstanding the fact that the latter port is open all the winter. It is still difficult to say for certain what will be the importance of the new town of Murmansk (Romanovna Murmane), which has been founded at the terminus of the railway.

Before the war, the whole Murman Coast except the town of Kola had the right of *free trade*. The result is that goods imported from abroad are incomparably cheaper there than in Archangel. The sale of spirits has been forbidden in Murman since 1886. The illicit sale is however very prevalent. Norwegian rum and Russian vodka are still, as before the prohibition, decisive factors in the economy of the fishermen.

The most important harbour places on the east and south coasts of the Kola Peninsula are Umba, Kandalaks and Kuzomen. The first-named is also a winter port.

J. G. GRANÖ.

V. SOCIAL CONDITIONS.

I. Housing.

The Lapps have at least two dwellings for the different seasons, the »winter place», in the winter village or »market» in the interior, where all the families of the pogost assemble, with their reindeer herds, for Christmas, and the »summer place» on the sea coast, near the family's fishing ground and the reindeer's summer pasture, sometimes as much as 100 kilometres from the winter village. The Tuloma Lapps have in addition »spring» and »autumn places», some of them possessing no less than five different dwelling places, which are each used in turn. Most of the dwellings are now built of logs, especially in the »winter places». Turf huts or »gammas» are still used to some extent as summer lodgings, or often placed beside the log hut and used only for cooking

in. (Fig. 18). The huts are small, built of round logs, and provided with a fireplace and one or two small windows. Along one wall there is sometimes a part with an earthen floor, instead of the usual wooden floor, for keeping the cooking pots on. Along two sides there is wide, low sleeping bench fixed to the wall. There is often a flat baking oven under the open sky outside. There are one to three outhouses raised on piles close by, and sometimes beside them a small larder on a high post, a so-called «nili». The winter places are generally closely built. As many as 40—50 dwelling huts can be found in them, and countless outhouses. Nowadays the houses are often built with two rooms, in one of which the baking oven is placed. The winter dwellings are better built than the others, but if necessary, for example, when pasturage and fuel fail, the whole village can be removed to another place, — it may be, every 20—40 years. In some places, e. g. on the Ter Coast (Lumbovsk, etc.), the summer villages are also closely built, and largely constructed of planks from shipwrecks, for lack of other timber. Asphalte felt has also been seen used as roofing.

The Finns' cottages are of hewn logs, and on the coast sometimes of turf with wooden supports. They generally contain a living room with a cooking range and an inner room warmed by a tiled or iron stove. There is often in the same building and under the same roof, but separated from the dwelling rooms by an outer lobby, a shed and a byre. The better houses are built on a stone foundation. The roof is of planks, turf or asphalte, and during the winter the windows are double. The walls of turf cottages are lined inside with boards or pasteboard; there is generally no ceiling. A room of this kind is warm, but damp, especially when new. The fuel is wood, and on the coast also turf; on the Rybatchi Peninsula turf only. The furniture includes a table, chairs, hassocks, a hanging clock, plants in pots, a shelf for milk and pots, a lamp and an extending bed. The bathhouse deserves special mention among the outhouses, and is in constant use.

The Norwegians seldom use turf buildings, but construct their houses of planks 2—2½ inches thick, and line them with pasteboard. The houses generally contain 2—3 rooms. Fixed cooking ranges are comparatively rare, iron stoves being generally used. Chairs are used to sit on; only the poorest people have benches. The outhouses are apart from the dwelling houses, and there are no bath-houses.

The Russians' and Carelians' buildings are constructed of round logs (Fig. 15), small timber being used in the eastern regions. The dwelling houses are divided into two rooms by plank walls, one room forming the kitchen and having a bake-oven which also warms the other room. Wood is used for fuel.



Fig. 18. Log Huts of the Kamenski Lapps, on the Ponoï River.
Photo I. K. Inka.



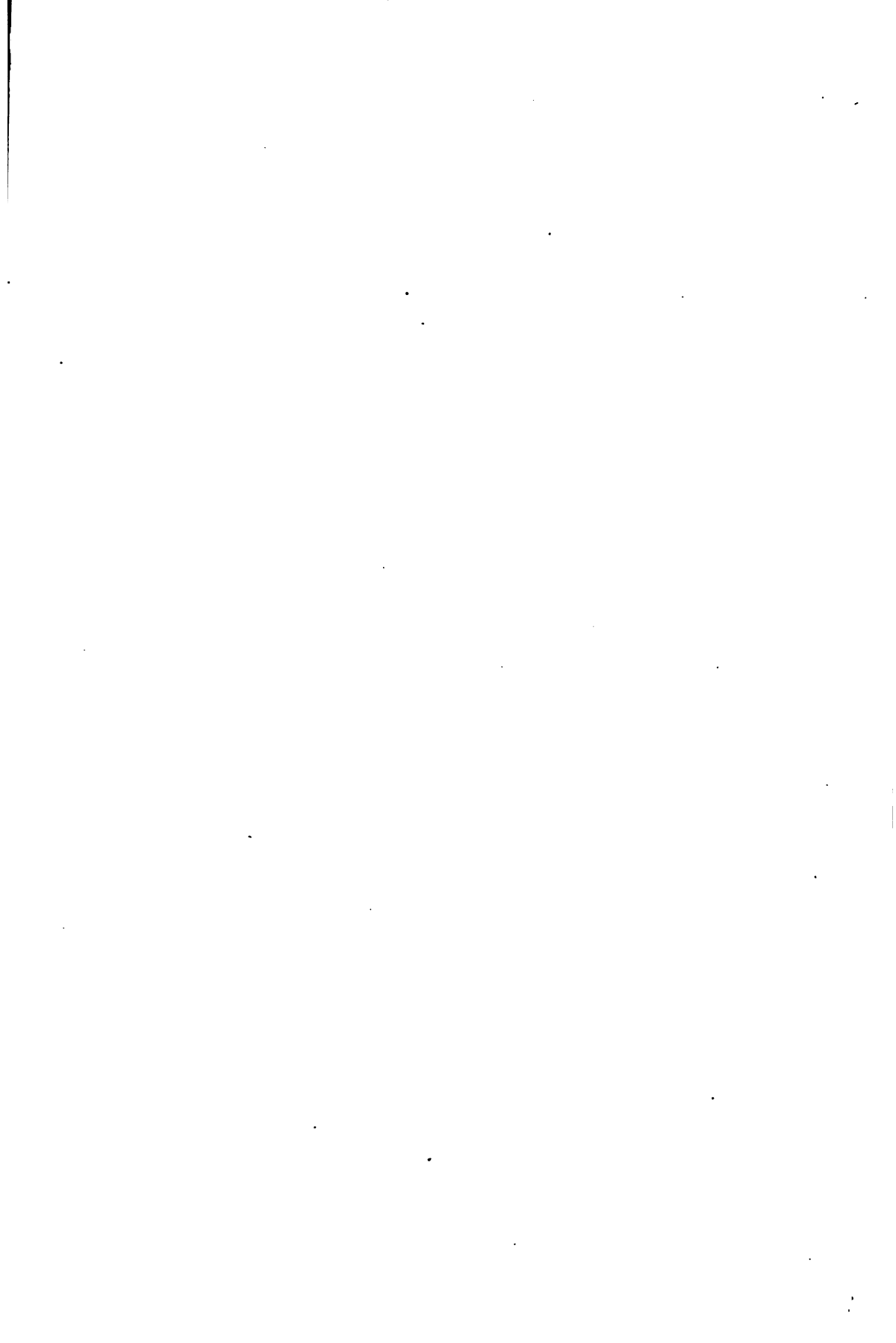
Fig. 20. Village of Venehjärvi, Vuokniemi. Province of Kem.
Photo I. K. Inka.





**Fig. 19. Kivakka Rapids in the Oulanka River, and
Kivakkatunturi Fell.**

Photo I. K. Inaa.



There is an attic, which sometimes contains a small room, with no stove, for the younger members of the family to sleep in, or for letting to fishermen. The whole dwelling is more poorly equipped than among the Finns and Norwegians. The byre is generally under the same roof as the dwelling house, the sheds, open and closed, may lie separately, and the bath-house always does so.

9—10 % of the inhabitants who are listed as settlers are without dwelling places, and 45—50 % of the unregistered inhabitants. With regard to the location of the dwellings, the Finns generally place their buildings at a considerable distance from each other. Thus, the 14 homesteads in Great Muotka lie within a radius of 20 versts, while 40 homesteads at Uura are within a radius of only 6—7 versts. The Russians and Carelians build closer together (Fig. 15). The 44 homesteads at Teriberka are within a distance of one kilometre from each other. The Norwegians live closer together than the Finns, but not so close as the Russians.

2. Dress.

Complete *Lapp costume* is only worn by the Lutherans of West Murman, the «filmans». The Greek Catholic Lapps (Fig. 13) have adopted Russian dress. They only retain as an inheritance from previous ages, the footgear, sometimes the felt shirt («mekko»); and the winter outfit; — fox-fur cap with a cloth crown, reindeer mittens, gloves and «jaarat» (a kind of fur boot). The most noticeable feature of the women's costume is the headdress (originally of Russian model) which varies for unmarried women, wives and widows.

The working dress of the Murman *settlers* is much the same all over the territory; thick felt trousers, a warm woollen blouse (called an «icelander»), underneath it a thin blouse and a shirt, long high-legged boots, and a hat or cap. In damp weather an oilskin coat and trousers are put on over the rest, and an oilskin hat, a sou-wester, on the head. On more solemn occasions what are called «town clothes» are worn. In the winter, the Lapps generally wear clothes of undressed fur, or at least fur boots with the hairy side out, which are tied round the ankles. The Russians on the east coast, like the Zirianians, wear inner and outer mittens («malitsa» and «sovik») and boots («kamas» and «pim») of fur. The dress of the Finnish and Lapp women consists of a chemise, jacket, skirt, kerchief, woollen stockings, and undressed fur boots or soled boots. The Russian women wear a different sort of bodice and a sarafan.

3. Food.

In the winter the *Lapps* eat reindeer meat and salt or dried fish, and in the summer fresh fish, berries and to some extent sheep's milk. All the year round they use flour, a little grain, tea and sugar. Before the war vodka was generally consumed. The chief meal, with cooked food, is left till late in the evening or midnight. During the day they eat dry food and drink large quantities tea.

The chief foods of the *Finns and Norwegians* are fish and bread; they also have beef and mutton, milk, grain, sea-birds and their eggs, potatoes and turnips. Coffee is used as a stimulant. They have three meals a day. The most usual intoxicant is Norwegian rum, but vodka is also used. Tobacco smoking is general.

The *Carelians and Russians* have less varied food, as their cattle afford only insignificant quantities of meat and milk. In place of butter they use the fat of cod. Their beverage is tea, and their luxuries are vodka and mahorka tobacco rolled in paper.

There are fairly convenient arrangements for supplying the inhabitants of Murman with bread. The state has a flour depot in Alexandrovsk, various committees have depots in Teriberka, Petchenga, and Salmajärvi, and there are also separate cooperative funds, one for the Kola Lapp volost, and others for the villages of Petchenga, Bumansfjord (Pumanki) and Uura. In Lapmark proper or in the interior, there are neither flour depots nor cooperative funds; the Lapps get their flour from Kola, Petchenga, and sometimes Teriberka. There are stores of salt for «pomores» and settlers in Alexandrovsk (the main store), Gavrilovo, Rynda and Harlovka.

4. Conditions of Health.

The severe climate, the monotonous food, especially, in the winter, and to some extent also unsatisfactory housing conditions, make *sickness* frequent in Murman. The commonest diseases are scurvy, affections of the respiratory organs, tuberculosis, influenza, gastric affections and rheumatism. For a long time the state neglected the care of health, and disease worked havoc, especially during the fishing months, when large numbers of unsettled people collected in the ports, and were housed in crowded and dirty dwellings.

There is now a district doctor living in the province of Alexandrovsk, who has under him four «barber-surgeons» (in Alexandrovsk, Kola, Petchenga and Teriberka). Alexandrovsk has a hospital of its own, and in the most impor-

tant of the Murman settlements, Teriberka, Gavrilovo and Rynda, there are Red Cross hospitals, to which doctors and sisters of mercy are sent every summer from Archangel. There are very primitive arrangements on the Murman Coast for assistance at confinements, for there is only one midwife, who lives in Alexandrovsk. Under these circumstances it is not surprising that mothers often apply to the barber-surgeons. They are even employed by the peasant women, whose modesty in this particular point is very great.

The health conditions of a large part of Kola Lapmark are anything but satisfactory. It is significant that more than half the mortality takes place among children under five years.

T. ITKONEN.

5. Religion and Education.

The greater number of the inhabitants of Kola Lapmark — the Russians, the Carelians and the majority of the Lapps — count themselves members of the *Greek Catholic Church*. Their spiritual needs have not received adequate care. Churches and chapels are certainly to be found in all the larger places, and even in small villages, (there are 34 altogether), but the number of parishes is too small (16), and the ill-paid priests are not equal to their duties. Most of these clerics are ignorant and incapable, and many of them have actually been sent to Lapmark as a punishment for more or less serious misdemeanours. The towns are naturally better off. The centre of the spiritual life of the territory is St. Trifon's ancient monastery at Petchenga, famous in the history of the conversion of the Lapps. It is the Mecca of the region, pilgrims congregate there from distant places, and its brothers have had a decisive word to say in many a mundane question.

The Finnish *Lutheran* cure of souls was long comparatively ill arranged. It is true that Finnish Pastors occasionally visited Murman, but these visits were all too short to leave perceptible traces behind them. Now that a Finnish pastor has settled down permanently in Alexandrovsk, conditions have naturally improved. The congregation is, however, scattered over 28 settlements, so that one man is not able to cope with the work. According to information furnished by the Murman pastor, the Finnish congregation there consisted at the beginning of 1915 of 1,942 persons, (1,001 males and 941 females). 85% of these were Finns, 9% Norwegians, 5% Lapps, and the remaining 1% Germans and Letts. The only church is in Uura. There is also a large room in Alexandrovsk which is available for services.

Until the last ten years Murman was entirely without even the most el

mentary educational establishments, except for a sort of monastery-school at Petchenga. Few of the Greek Catholics could read or write, rather more of the Lutherans. A few church schools were at work instructing the Lapps, namely one in the pogost of Kildin (where it soon came to an end), in Suonikylä, Lovozersk, Pasvik, and Nuortijärvi. Several of these were only temporary. In 1907 the Ministry of Popular Instruction opened four village schools in Murman, namely in Petchenga (Parkkina), Uura, Bumansfjord and Teriberkä. The village school in Nuortijärvi was opened in 1909 when the church school was removed thence to the pogost of Kildin. In 1910 village schools were opened in Tsypnavolok and Salmijärvi. Four of the Murman schools have boarding houses for pupils who live at a distance. In the year 1909—10 the four oldest village schools contained 124 pupils, and four church schools (Kildin, Suonikylä, Lovozersk and Pasvik) had 67 pupils. There was further a town school in Kola with a one year's course, and one in Alexandrovsk with a three years' course. The pupils in these in the same year numbered 98.

There were in Murman and the interior *four libraries with reading rooms*. The number of books borrowed during the year 1909 was 11,200, borrowed by 210 persons. Since 1910 there have also been two *ambulatory libraries* at work for the Murman settlers; the Finns have one similar library.

J. G. GRANÖ and T. ITKONEN.

VI. THE CLAIM OF FINLAND TO A SHARE IN THE ARCTIC COAST.

As early as the Middle Ages both Sweden and its neighbours Norway and Russia made claims to wide stretches of the Arctic coast. A common territory therefore came into being, in which tribute was levied by each of the three states. In more recent times efforts were made to get the frontiers between the different states more definitely fixed. Thus the frontier between Russia and Sweden was drawn by the peace made at Täyssinä in 1595, and cut through the forest in the following year. This frontier was to run from Iivaara in the present parish of Kuusamo, »straight across Lake Enare», between the Varanger and Neiden Fjords, »right up to the Northern Ocean» (the Arctic). It was thus expressly recognised that the Arctic coast west of that frontier belonged to Sweden. Subsequent frontier agreements between Sweden and Russia only said quite shortly that the frontier in the extreme north was

to be unchanged. Nevertheless Sweden soon lost to another power the territory which had been recognised to belong to it by the peace of Tåyssinä. Norway also had ancient claims on the Arctic coast, and this was one of the causes which led to the war between Sweden and Denmark—Norway in 1611. The war ended badly for Sweden, and the Peace of Knärod in 1613 decided that the Arctic coast between the Titiş Fjord and the Varanger Fjord should belong to Norway. Thus both the Norwegian and the Russian frontiers ended at about the same point on the Arctic coast, and the Swedish rights to the territory on the said coast remained obscure. Nevertheless there was still an extensive territory south of the coast which was common to the three states, and Sweden continued to maintain that the southernmost portion of the shore of the Varanger Fjord was also its property. Sweden did not abandon its claims to southern Varanger until the frontier between Sweden and Norway was more accurately demarcated by the frontier treaty made at Strömstad on October 2nd, 1751. The frontier between the two countries was marked out as far as the Kolmisoaivi fell, but no further, as Russia also had a share in the territory lying east of that fell. This common territory was generally called by the Norwegian name, the »Faellesdistrikt». Its frontiers were somewhat indefinite. According to contemporary maps it stretched from the Bugo Fjord and Kolmisoaivi to Carls Gammen (Aidenjarga) and Muotkavaara, south of the Rybatchi Peninsula, as shown by the map appended. It does not seem to be clear whether the Faellesdistrikt was common to Russia and Norway alone, or whether Sweden also had territorial rights there.

Although Sweden's territorial rights of possession to the Arctic coast were thus obscure, that state had instead generally recognised and unquestionable economic rights in the far north from very ancient times. The inhabitants of Swedish Lapmark had fishing and sealing rights in the Arctic Ocean, and the right to feed their reindeer during the summer on Norwegian territory, just as the Norwegian Lapps had the right to drive their reindeer herds on to the Swedish side during the winter. This arrangement was expressly confirmed by the agreement made at Strömstad in 1751, which declared that the Swedish and Norwegian Lapps should be allowed to migrate unhindered from one country to the other, to use the interior and the coast, and to carry on fishing and sealing. These rights were energetically exercised by the Swedish subjects. The Faellesdistrikt and its coast also were open to the Swedish Lapps.

When Finland was separated from Sweden in 1809 and united with the Russian Empire, the rights which Sweden had previously possessed on the Arctic Coast were transferred to the new Finnish state. During the first few

years after the conclusion of peace, Finnish subjects were allowed to avail themselves of all the rights mentioned in the Strömstad agreement.

The rights and advantages of Finland were, however, completely ignored in the agreement made on May 14th, 1826, between the Tsar of Russia and the King of Sweden and Norway, concerning the division of the Faellesdistrikt. No representative of Finland took part in the negotiations, and the agreement made was very disadvantageous to this country. In the first place, the agreement does not suggest that there was even any discussion of Finland's possible rights to territory in the Faellesdistrikt, but the area was simply divided between Norway and Russia. The frontier between Norway and Finland from Kolmisoaiva further to the south-east was demarcated at the same time, and in doing this the mistake was made of not drawing the frontier to a Muotkavaara situated south of the Rybatchi Peninsula, as should in justice have been done, but it was drawn to another Muotkavaara lying further to the west, whence the frontier runs up to the present day. The frontier between Norway and Russia began at Muotkavaara, where that between Norway and Finland ended. It was decided that it should run thence to the Patsjoki, and along that river to the Greek Catholic church of Boris Gleb, which is on the left bank of the river. The church and surrounding territory should belong to Russia. Hereupon the frontier made a sharp bend to the east, to the sources of the Jakobs river and thence was drawn along that river to the Arctic Ocean. In addition to the fact that Finland received no share in the Faellesdistrict, this agreement deprived its inhabitants of all the economic rights they had possessed since primeval times, and which had been confirmed by the treaty of Strömstad. Thus, the frontier agreement of 1826 expressly forbade the inhabitants of the one state to let their reindeer herds feed on the other side of the frontier, and it was decided that the fishing rights should remain as they had been for a period of six years only, and then cease. Russians have asserted that this for Finland very disadvantageous treaty was brought about by the Norwegians bribing the Russian envoy at the negotiations. This assertion has certainly not been established by evidence, but it is maintained by several writers.

As soon as the treaty came into force, the Norwegian authorities began to put difficulties in the way of Finnish subjects carrying on fishery and sealing as they had done before in the Varanger Fjord. At the same time, however, the Norwegian Lapps repeatedly drove their reindeer herds on to the Finnish side, making use of the right to feed their reindeer there which had been recognised by the treaty of Strömstad.

For this reason the governor of the province of Uleåborg was, during the next few years, constantly obliged to send complaints to the senate, reporting on the Norwegians' enmity to the Finns on Norwegian territory, and their encroachments on the Finnish side of the frontier. Diplomatic negotiations between Norway and Russia were opened several times in order to clear up these disputes, but they never led to any result, as the Norwegians' interpretation of the treaty of Strömstad was that they themselves continued to enjoy all its advantages, while for the Finns only the obligations remained. In the course of the negotiations, a question was raised of the exchange of the parish of Enontekis for some Norwegian territory in southern Varanger, but the proposal never led to any action.

As the negotiations led to no understanding, and as the inhabitants of northernmost Finland were appreciably injured by the Norwegian reindeer herds which came over the frontier, Tsar Nicholas I. ordained that the frontier between Norway and Finland should be closed to Norwegian reindeer herds from September 15th, 1852. The Finns were at the same time forbidden to seek reindeer feeding grounds, or to fish or hunt, in Norway.

In order to compensate the inhabitants of Finnish Lapmark, at least to some extent, for the loss of income caused by the closing of the frontier, the Secretary of State announced on June 30th, 1854, that the Tsar had conferred on the Lapps the right of fishing and sealing in the parts of the Archangel government on the Arctic coast situated nearest to the Norwegian frontier, except in places where Russian subjects carried on fishery. In order to discover how far it might be worth while for the distant Finnish Lapps to make such expeditions to Russian waters, the governor was instructed to equip two boat's crews at the national expense, to fish for one or two summers on the coast of the Arctic Ocean.

A trial fishery arranged by the governor of the province of Uleåborg in 1858 showed that there were no greater difficulties in the way of fishing east of the Jakobs river than in Norway, and that the yield was equally abundant; owing to the long distance, however, the Finnish subjects could not carry their wares home. The governor proposed therefore, in a communication dated June 18th, 1861, that two fishing stations should be established on the Arctic coast, east of the Jakobs river, and that the whole of the uninhabited coast stretching from the Jakobs river to the other side of the Falk Fjord, a strip of the interior about 30 versts wide, the Hen Islands, and as far as possible also the west coast of the Rybatchi Peninsula, should be united to

these fishing stations and possessed by them free of taxation and independently of the Russian authorities.

The senate gave this proposal its support on March 17th, 1862. The Tsar asked the opinion of the Russian ministers of Finance and National Demesnes, who had no objection to the proposal as such, but were opposed to granting exemption from taxation, and considered it essential that Russian law should run in the territory. The Russian and Finnish authorities exchanged communications on the subject without coming to any agreement.

Meanwhile another question had come up which was shortly to be closely connected with the above. The Russian authorities had proposed the separation from Finland of the Systerbäck rifle factory and its area, and its incorporation with the government of Petersburg. The Finnish senate, in delivering its opinion on the proposal, suggested that if the area of the Systerbäck rifle factory were separated from Finland, Finland ought to be given in compensation the coastal territory on the Arctic ocean, on which it had already been suggested that fishing stations should be established.

This view was supported by the Tsar, and on February 15th 1864, there was placed on the Finnish statute-book an imperial decree, which declared that the Systerbäck rifle factory should be separated from Finland, but announced at the same time that »compensation for the land in question will be made to Finland in the future, either the stretch of Arctic coast east of the Jakobs river and adjoining the Gulf of Stolbova the granting of which as a fishing place for the Finnish Lapps has already been suggested, or also within the said (Petersburg) government», after the grading and valuation of the available property situated near the Finnish frontier.

The promise in this imperial decree, however, remained unfulfilled. This was clearly due to the negative attitude adopted by the Ministries of Finance and of National Demesnes in the question of the fishing stations. Under these circumstances, no change took place in the condition of the fishers, which remained still as wretched as before. Neither was it much assisted when, in 1868, an imperial decree granted special advantages to settlers who migrated to the Murman Coast.

The distressed condition of the inhabitants of northern Finland caused the governor of the province of Uleåborg to take the matter up again. On March 30th, 1880, he submitted to the senate a report on the conditions on the Arctic coast and among the Lapp fishermen who lived there. He suggested at the same time that that portion of the Arctic coast which stretches from the mouth of the Jakobs river to the Petchenga Fjord, a strip of land

behind the coast 20—30 versts wide, the Hen Islands, and the fishing waters belonging to this area should be granted to Finland in perpetual possession. The governor also asked that a narrow strip of land east of the Norwegian frontier, two or three versts wide, should be granted to Finland, where a road and feeding stations could be established for the reindeer herds on their way to and from the Arctic Ocean. Finnish law should run in this territory, and Finnish officials be appointed. All the inhabitants, both Finns and Russians, should be secured in their rights to the ownership and enjoyment of their homesteads and fishing places.

Before the governor's proposal came before the senate, however, the question had been taken up by the Diet. At the Estates meeting of 1882, Rob. Castrén, representative of Nykarleby in the Burgher Estate, proposed a petition to the government to ask it to take measures for the incorporation with Finland of the territory which had been promised in 1864.

This petition was sent to the Committee of Ways and Means, which made a report thereon, dated May 29th, 1882. In this report the Committee recalls the fact that Finns had removed to the Norwegian coast in such great numbers that it could be called a real migration. This was due to several circumstances. It was easier for the Finns to obtain dwelling places on the Norwegian side, among their numerous compatriots already living there; the Norwegian legal system was similar to that of their own country; the religious faith was the same; it was easier to dispose of the fish taken, and the necessary capital was more easily obtainable, as there were Finns or Finnish speaking dealers in all the fishing stations; further, there was a doctor, a hospital, means of communication, and other advantages of civilisation. Under these circumstances, the only way of checking the emigration to Norway was by giving Finnish subjects the same advantages on the east frontier as they obtained on the west. It was therefore essential that Finnish administration and the Finnish legal system should run east of the Jakobs river, and there was also a reason for this, to be found in the imperial decree of 1864 which promised alternatively, a strip of land on the Arctic coast in compensation for the area of the Systerbäck rifle factory which had been incorporated in the Petersburg government. In considering how large a piece of territory ought to be allotted, the Committee of Ways and Means took into special consideration the facts that the area ought to include, first a well sheltered harbour on which a town could be established, and secondly at least some forest land, from which the inhabitants could obtain the most indispensable fuel and building material, and finally that the tract of land ought to include the area where there

already was a Finnish population. The first suitable harbour counting from the Norwegian frontier would be Normansätt at the mouth of the Petchenga Fjord, so that the area ought to extent at least as far as that harbour. There was suitable forest land both on the Patskoki and on the Peisen river, 100—120 kilometres inland from the sea coast. The proposed town would, however, not be able to supply itself with building material and fuel from the Patsjoki, as to do so the timber would have first to be brought down to the mouth of the turbulent Patsjoki, and then conveyed thence about 40 kilometres along the stormy coast of the Arctic Ocean. It was therefore necessary that Finland should be granted a tract of land reaching as far as the Peisen river. And if it was taken into consideration that the parts of the coast where there was a Finnish population ought to be united to the area, it would also include the west side of the Rybatchi Peninsula, where the largest number of Finns were settled. The Committee of Ways and Means proposed therefore, that the frontier of the said territory should run from Konnustunturi 30 kilometres due east, to the little lake where the Patsjoki has its eastern source, run thence 40 kilometres south-east to the sources of the Peisen river, and then along this river to the bottom of the Peisen Fjord, whence the frontier should be drawn across the isthmus of the Rybatchi Peninsula to Muotka and thence northwards to the sea east of Vaida-Guba. The territory would thus be about 4 000 square kilometres, which at the first glance might seem very large compared with the 12 square kilometres of the area of the Systerbäck rifle factory. If, however, it was taken into consideration that the territory consisted merely of rock, fell and bog, with an inconsiderable, thin forest in the south, so that the whole tract must be regarded as waste land, it could by no means be considered more valuable than the site of the Systerbäck arms factory.

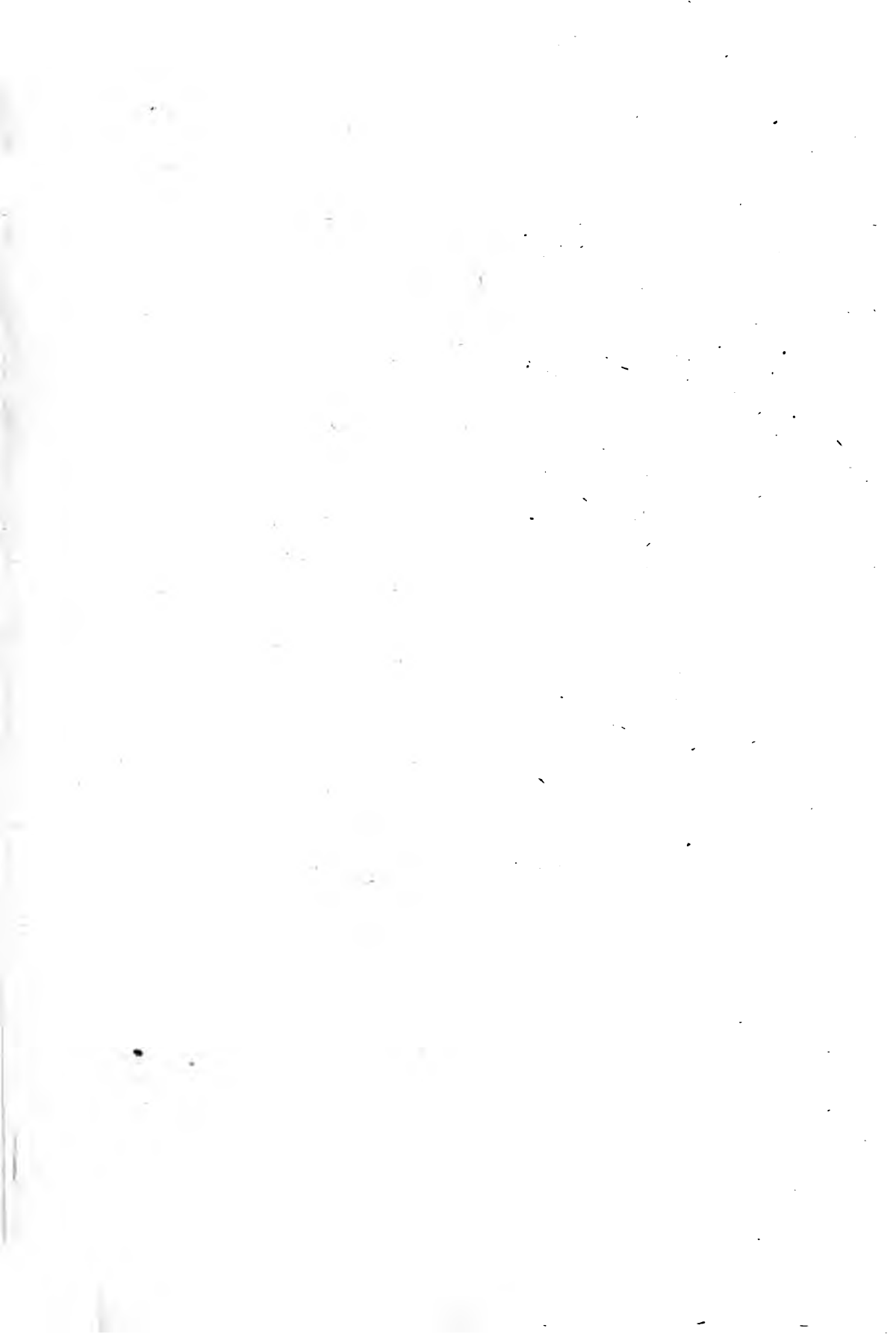
The petition was approved by all the Estates, and the Tsar asked for the opinion of the Senate thereon. On May 7th, 1883 the matter was discussed at a session of the senate. The official letter already mentioned, written by the governor of the province of Uleåborg in 1880, was taken into consideration at the same time. The senate, in giving their opinion, warmly supported the petition of the Estates. They declared that it was based on right and just reasoning, namely the facts that the inhabitants of the most northerly portion of the country had lost their ancient rights to an important source of income, and that an advantageously situated piece of land in the south-east of the country had been separated from Finland and united to the Empire, together with the express promise of Tsar Alexander II. given in 1864, that

Finland should be compensated therefor by receiving a tract of land, by which he chiefly meant the Arctic coast.

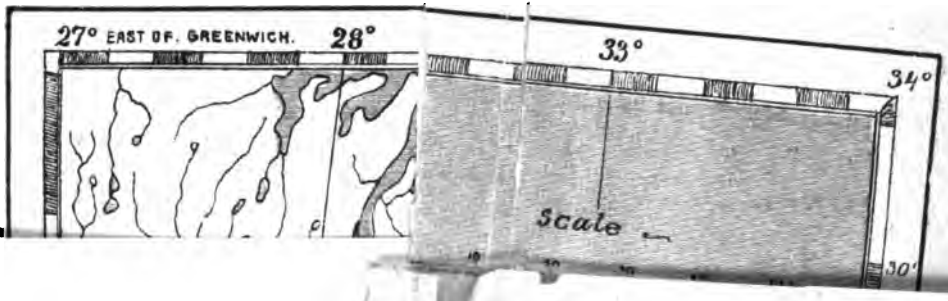
The favourable opinion of the senate led, however, to no result, and the whole question was afterwards removed from the order of the day. This does not, however, mean that the question of obtaining a port on the Arctic Ocean was entirely abandoned by the Finns. Thus, at the beginning of the twentieth century, the then governor of the province of Uleåborg submitted to the senate a proposal that negotiations should be opened with a view to exchanging Enontekis for a Norwegian port, but the senate did not think it necessary to take up the question.

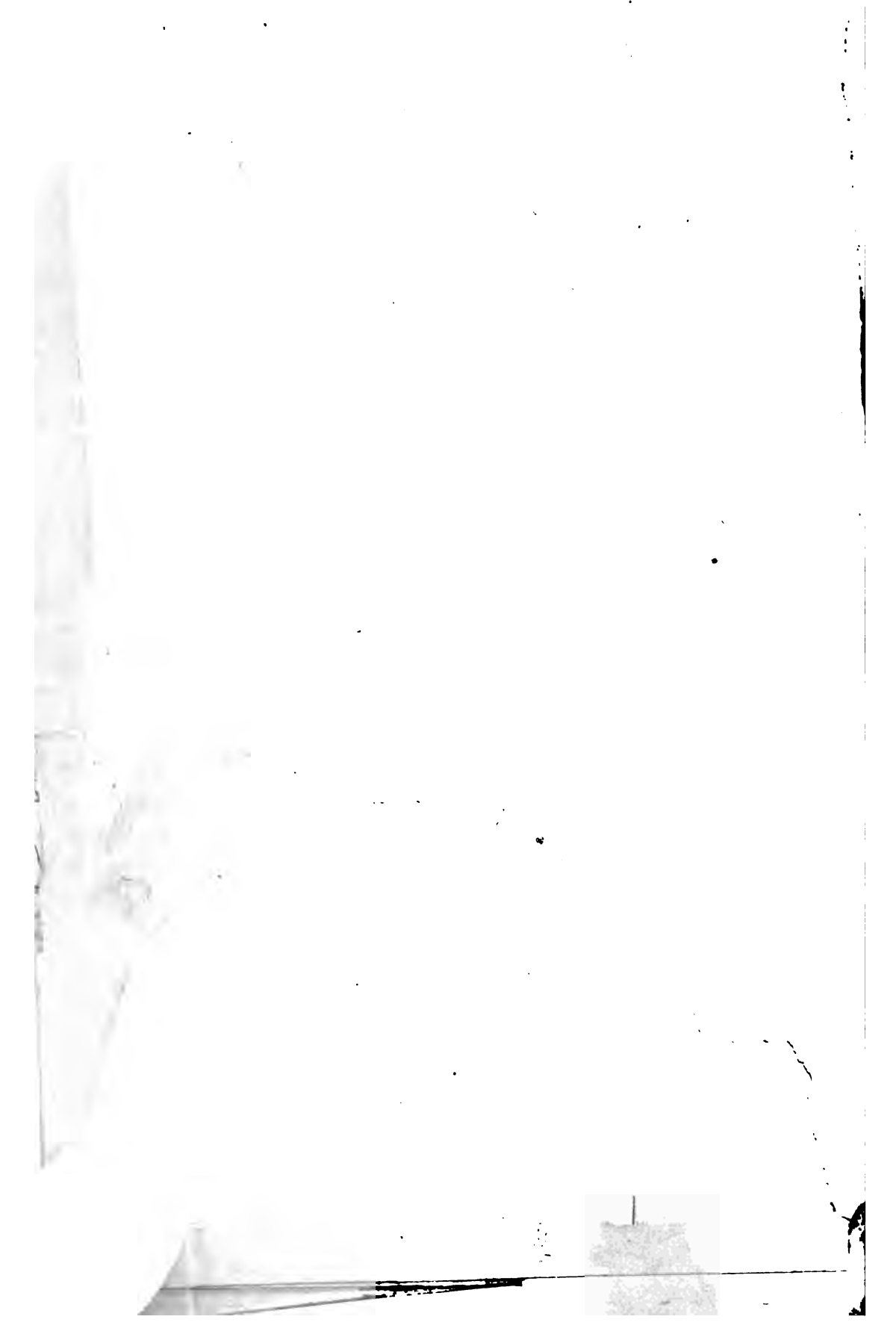
It may be mentioned that during the Red insurrection in the spring of 1918, an agreement was made between the Russian Soviet republic and the Finnish Bolsheviks concerning the surrender to Finland of an area on the Arctic coast against special compensation; the eastern frontier of this area was to run from Korvatunturi on the present frontier between Russia and Finland in a straight line to the sources of the Peisen river, thence along the watershed east of the Peisen river to the Muotka Fjord, and across the Rybatchi Peninsula in a straight line to the coast of the Arctic Ocean at Subovska. This treaty naturally never became of any importance. At the peace of Dorpat, however, which was made between Finland and Russia and signed on October 14th 1920, Finland obtained a piece of territory of which the eastern frontier begins by dividing the Gulf of Vaida, on the north coast of the Rybatchi Peninsula, runs south- and south-eastwards from the innermost end of that gulf, divides the isthmus between the Bumans Fjord and the Gulf of Ozerko, divides the isthmus which joins the Sredni Peninsula to the mainland, and then runs in a straight line to Korvatunturi, on the former frontier between Finland and Russia.

GUNNAR SARVA.



THE REGION.





PART II.

EAST CARELIA

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INTRODUCTION.

Situation, Boundaries, Area, Administration, Judicial
and Ecclesiastical Divisions.

The *boundaries* of the East Carelian territory can be differently drawn, according as they are determined by ethnographical, geological, botanical or geographical considerations. In what follows, East Carelia is taken to comprise the provinces of Olonets, Petrosavodsk and Povenets in the government of Olonets, which form what is called Olonets Carelia (Aunuksen Karjala in Finnish), and the province of Kem in the government of Archangel, which forms what is called Kem, or White Sea Carelia (Vienan Karjala in Finnish). The boundaries of this territory do not wholly coincide on the east with the boundary of the Finnish natural history territory, for a part of the natural history area of East Carelia lies to the east of the administrative boundary. The geological and geographical boundaries correspond fairly well to the natural history one, while the boundary of the territory inhabited by Carelians lies at present further to the west. If therefore the boundary be drawn according to population, the eastern part of the natural history district lies east of the boundary. There is this advantage about adopting the administrative boundary, that then the official statistics, which are always arranged by provinces (ujezd) can be used.

East Carelia lies to the east of Finnish Carelia and Ostrobothnia, stretches to the south and south east to Lake Ladoga, the river Svir (Syväri in Finnish) and Lake Onega (Äänisjärvi in Finnish), and extends eastwards to the White Sea. Roughly speaking, it lies between 60° and 67° north latitude, and longitudes 31° to 35° east of Greenwich. Its northernmost point is on the frontier of the Kola Peninsula (Kaitatunturit, $67^{\circ} 13'$), its southernmost on the coast of Lake Ladoga on the northern side of the mouth of the Svir ($60^{\circ} 41'$), its westernmost in Kem Carelia ($29^{\circ} 36'$ east of Greenwich) and its easternmost point on the boundary between the provinces of Povenets and Podosh ($36^{\circ} 30'$). Thus except for the regions round Kouda and Kandalaks, which are north

of the Polar Circle, East Carelia belongs to the northern part of the temperate zone. Geologically it belongs to Fennoscandia.

The northern frontier, that against the Kola Peninsula, has been described in the chapter about that territory. The greater part of the eastern frontier is formed by the sea. Carelia is washed by the waves of the White Sea from Kandalaks to the mouth of the Kem river, and this strip of land is called the *Carelian Coast*. South of the Kem river the land is washed by the Gulf of Onega, and is here called the *Pomorian Coast*. Thence the eastern frontier runs over land, beginning between the villages of Niuhtsha and Uneshemskoye on the Gulf of Onega, and running mostly over bog and waste to Lake Onega, the shore of which it touches south of Rimskaya. The boundary then follows that lake and the river Svir to a point opposite the Jandeba, a tributary of the Svir, where it turns westwards, running thence in a curve across Lake Segeshskoye to the coast of Lake Ladoga. The western frontier runs from this point, the most southerly in East Carelia, along Lake Ladoga, to the frontier of the Finnish parish of Salmis. Thence it follows, right up to Kola Lapmark, the Finnish frontier as determined first at the Peace of Stolbova (1617) and afterwards finally confirmed in 1621 after a number of disputes.

The area of East Carelia has been planimetrically calculated for the present work, and comes to 148,725 square kilometres; (57,425 square miles). 70,200 sq. km. of this territory (the province of Kem) belongs to the government of Archangel, and the remaining 78,525 sq. km. to the government of Olonets. But if the boundary against Kola is drawn along a line from Kandalaks to Vaatsimenoiva (see the introduction to the chapter on Kola Lapmark) the area of the territory comes to about 136,700 sq. km., which is more than a third of that of Finland.

The system of *justice and local government* hitherto in force in East Carelia, as in Russian Lapmark, is described below, in so far as it has been possible to organise it in these thinly populated regions where patriarchal conditions still prevail among the Carelians.

Each government is administered by a *governor* who is at the head of a board of civil servants. The government is divided into districts or provinces for the preservation of order and the administration of the laws, the chief police official in these provinces being the «ispravnik». The official next under him is called the «stanovoi», and the lower police officials are the «urjadniks» and «strasniks».

The *zemstvo* is a kind of organ of self government, and there is a *zemstvo* for each government and each province. It is a meeting of representatives of

the nobility, the burghers and the peasants, which usually meets twice a year, and appoints special committees, «uprava», from among its members to deal with current matters. Its duties include the provision of popular instruction, the care of health, the construction of roads and building of churches, and so on. In actual fact, the zemstvos have no very great importance, chiefly because the governors, as representatives of the central government, have the right to veto their decisions, and also because there are special «zemski natchalniki» (local superintendents) who are specially entrusted with the duty of supervising communal self government. Each province is divided into smaller areas «administered» by these officials. There are also, side beside with the zemstvos, local organs of self government for the towns and the communes, which are also supervised by a natchalnik and the governor. The town has its council, the so-called town *duma*, with a burgomaster at its head, which also has the right to elect committees, uprava, from among its number. In the communes or «volosts», the chairman or «elder» of the commune (starshi), together with a clerk (pisar), is responsible for the administration. It is his duty to publish decrees of the central government, to maintain order, to collect statistics, to issue passports, and to collect the rates and taxes. The communal council consists of the elder of the commune, the elders and vice elders of the villages in the commune, and the tax collector. The elder is appointed for a period of three years at a communal meeting (volostnoi sud) to which every ten homesteads elect one representative, and which is summoned by the natchalnik when necessary. It is also the duty of the communal meeting to supervise the work of the communal officials, to determine the amount of the communal rates, to appoint guardians for orphans, etc. More important decisions are in the hands of the provincial council. The organ of village self-government is the *mir* (meeting) in which all the peasants have a vote, and proceedings are conducted by the elder of the village, the «starost». The village clerk keeps the minutes. If several villages belong to one mir, the meetings are generally conducted by the elder of the commune. The most important duty of the mir is to administer the land belonging to the village, and from time to time to divide it amongst the peasants. The mir also has charge of other village affairs. It fixes the date of the haymaking, appoints the village elder, village herdsman and rate collector, decides whether new-comers shall be admitted to membership of the village, and so on.

For the administration of justice the provinces are divided into magistrates' districts. The magistrates are appointed by the zemstvo of the province, and have jurisdiction in civil cases where the sum involved does not exceed

500 roubles (in several Russian governments this sum was raised to 1,000 roubles by a decree of the year 1912), and in criminal cases where the legal penalty involved is a fine not exceeding 300 roubles or one year's imprisonment. In civil cases where the sum involved is more than 30 roubles, and in criminal cases where a sentence of more than 15 roubles fine or three days imprisonment is inflicted, an appeal can be made against the decision of the magistrate to the *magistrates' conference*, which is held monthly and deals with cases of appeal against the decision of individual magistrates. There are also so-called *ordinary courts*, viz. the subordinate «okruzhnoi sud» (district courts) and the «sudebnaya palata», courts of higher rank. The former cover several provinces, and the latter several governments. The district court pronounces final judgments, but in all civil cases an appeal can be made to the higher courts. If their decision is not accepted, a further appeal for amendment of the verdict or retrial of the case can be made to the *senate*, which is the only court of cassation in the empire.

Patriarchal administration of justice is very marked in East Carelia, but apart from this, small offences and disputes are dealt with at village meetings, and especially in the *communal courts* (volostnoi sud). According to the decree of 1912, these consist of three ordinary members and two alternates (one of the ordinary members acting as chairman) who are chosen by special electors elected by the peasants. The election is ratified by the magistrates' conference. The communal court has the jurisdiction in civil cases where the sum involved does not exceed 100 roubles, and in criminal cases where the penalty does not exceed a fine of 100 roubles or 30 days imprisonment. Finally it may be noted that the elder of the village has the right, when necessary, to inflict a sentence of one rouble fine or two days imprisonment. If any one feels himself aggrieved by this, he can complain, within eight days, to the natchalnik, who has the right, if he thinks fit, to sentence the elder to a fine of 5 roubles or 10 days imprisonment.

In actual practice, it is exceedingly rare in the parts of the country with which we have to deal that any appeal is made against the verdicts of the village or communal courts, which deal with practically all disputes and offences. This is a pleasing feature in the character and customs of the Carelians.

The four provinces here described are divided respectively, Olonets into nine, Petrosavodsk into twelve, Povenets into ten, and Kem into twenty-two communes.

From an ecclesiastical point of view, the province of Kem, like Russian Lapmark, belongs to the bishopric of Archangel. A suffragan bishop has his

residence in the town of Kem. The provinces of Olonets, Petrosavodsk and Povenets belong to the bishopric of Olonets. The bishops are advised by spiritual consistories. The province of Olonets contains three deaneries and twenty-eight ecclesiastical parishes; Petrosavodsk has four deaneries and forty-nine parishes; Povenets, three deaneries and twenty-seven parishes; while Kem is divided into three deaneries and twenty-nine parishes.

There are eight monasteries in East Carelia, the largest of which is Solovets, on an island of the same name in the White Sea, some congregations of Old Believers, an Evangelist-Lutheran, a Roman Catholic and a Jewish congregation. Russian missionaries work in East Carelia to convert those who do not belong to the Greek Catholic Church. The interests of the Greek Catholic church, and of russification, are also watched over by the «Orthodox Fraternity of Carelia», an organisation founded in the autumn of 1907, whose activity is notorious in Finland.

J. G. GRANÖ and J. E. ROSBERG.

I. PHYSICAL FEATURES.

i. Surface and Altitudes.

If the frontier between East Carelia and Kola Lapmark is drawn as described above, the high fells of Kaitatunturit (cp. p. 4) fall within East Carelia, but if the more natural line between Kandalaks and Vaatsimenoiva is taken as the frontier, this group of fells falls within the northern territory, to which, with its naked summits (tunturit) and its undulating ridges clad in subalpine birch, it geographically belongs.

Generally speaking, the physical features of East Carelia immediately recall the neighbouring parts of Finland, the whole scenery being of the same character on the two sides of the frontier (¹). East Carelia is on the whole a hilly country, rich in lakes and bogs like Finland, with fir forest on the

(¹) The maps might easily suggest that there is a certain difference in the physical features of the two countries; thus the lakes for example on the Finnish side are many armed, often stretching for long distances in the prevailing orographical direction, while the lakes on the eastern side of the frontier appear on the maps as rounded and irregular. In reality, the lakes, like all the physical features, are of the same character, the difference being due to the fact that the Russian maps of East Carelia are unusually defective, and often highly diagrammatic.

slopes, pine forest on the moors, deciduous forest on land which has formerly been burn-beaten, ore-bearing lakes and winding rivers with many rapids.

Near the frontier we find that the fjord-like drainage system of the Finnish lake Paanajärvi is reproduced in a number of valleys, that the Kuusamo lakes and the ridges round them have their counterpart on the eastern side of the frontier, and that Tuulijärvi somewhat resembles Pielisjärvi in shape and features. A wide belt on the western side of the territory, lying at an altitude of 150—200 metres above the sea, contains a number of large lake basins, which are divided from each other by moors, swamps or low, rocky ridges covered with moraine gravel. In these basins lie the lakes of Koutajärvi, Pääjärvi, and Tuoppajärvi in the north; upper, middle and lower Kuittijärvi, Kivijärvi and Nuokkajärvi in the centre; and Lieksajärvi, Otajärvi and the large Seesjärvi and Uikujärvi in the south.

In some places high summits, generally standing alone, rise above this belt of the large lakes. Thus, the region between the Tuntsajoki and the Oulankajoki is a good deal broken, with summits that rise to a hundred metres above the general level of the ground. The highest are the fells of Kivakka (about 650 metres, fig. 19) and Päänuorunen (about 600 metres), on the Oulankajoki. Between Ylä-Kuittijärvi (about 207 metres) and Kivijärvi (about 230 metres) the land is high but not specially hilly, except for the region south of the Kuittijärvi lakes. The so-called Maanselkä, along which in places the frontier between Finland and Russia runs, is marked on the older maps as a real mountain chain. In actual fact it is a watershed, and can show certain heights here and there (e. g. Märkävaara, about 255 metres), but does not form any connected chain of mountains. From the basin of Lieksanjärvi southwards the ground sinks gradually, and large tracts of it are covered with swamps.

The belt of the great lakes and bogs is mostly unpopulated, except on the shores of the lakes, where villages are found (fig. 20). The »vaaras» (heights) offer wide prospects over endless solitudes; undulating summits rise above forest and marsh, one behind another till all fades away into the blue distance.

The interior of White Sea Carelia, between the lake and the coast belts, is a comparatively monotonous area, with very extensive moors, and generally only low summits. The greatest heights are from 50—100 metres in the valley of the Kem river and over 100 metres in the Tuoppajärvi district. Towards the Olonets frontier the general altitude rises to 150 metres, and the summits some 50 metres higher. North of the Kem river there stretch extensive bogs,

and still further to the north there are several large but shallow lakes (Kierettijärvi, etc.) The valley of the Kem is broad and imposing. There are many picturesque spots on its tributary, the Tchirkkakemijoki, especially where it passes through rocky portals or carves its way through ridges. Many long boulder-ridges intersect the territory, and form natural ways of communication between one area and another.

The interior of the northern portion of the province of Povenets forms the largest unpopulated area in East Carelia; and has not its like anywhere in Finland except in Lapland. In the midst of the waste, however, there is the little village of Pieninkä, containing two farms, on the shores of a lake that abounds in fish. The forests in that solitude are almost untouched to this very day. One can go fifty kilometres without seeing the mark of an axe or any other sign of human life. Not till one approaches the villages on Seesjärvi, or the neighbourhood of Repola, Himola and Rukajärvi, does one see here and there a pine which has been felled by some hunter in order to get at a squirrel which had stuck in the branches when he shot it. The ground is cumbered with withered and fallen pines, and in many places they lie on a layer of rotten wood which is a foot deep. On the moors, however, the soil has been destroyed by forest fires. In the western part of this wilderness the rocks are of gneis granite, and the summits rounded and comparatively low. The level ground is here something more than 100 metres above the sea. In the eastern part of the area, where the rocks are of quartzite and greenstone, the ground is very much broken. The valleys are 150—200 metres above sea level. The rocky ridges are mostly sharply cut, with steep sides, and in places attain a height of 300 metres. Their general direction is from north-west to south-east. In some areas, as in the upper reaches of the Vuolomajoki river, the ridges lie close together and the valleys between them are very narrow. In other places the ridges are further apart, and the depressions between are filled by moors and bogs. These last are especially extensive in the southern parts of the territory. The regions round the big lakes of Seesjärvi and Uikujärvi are more closely inhabited. The ground round the western side of Seesjärvi is much broken, with summits which sometimes rise to a height of 350 metres. The north-west shores of the lake lie especially high, and when seen from the lake have an imposing effect, with their chequered »svedjeland» in different shades of green, according to the different stages of re-growth which the svedjeland has reached. The landscape between Seesjärvi (110 metres) and Uikujärvi (87 m.) is comparatively flat (100—150 m.), as is also the area round the lake of Uikujärvi with its many islands. The western part of the upper Uiku-

järvi area, however, contains a number of quartzite ridges which run parallel with each other in a north-westerly direction. These continue into White Sea Carelia, as far as the region of Suikujärvi and Uskela. Northwards along the Murman railway to the coast of the White Sea, the country is quite level, with bogs as far as eye can reach.

The southern shores of Seesjärvi are high and rocky. There are fairly fertile areas between the rocks. (Fig. 21). South-south-west of Paadene there is a huge rocky ridge which stretches east of Selkienjärvi and Jänkäjärvi. Here rises among others the dominating Eninkivaara, south of the village of Selki. The extensive waste between Selki and Himola is flatter.

The rocky region south of Seesjärvi continues southwards in extensive and level wastes. Rocky ridges of quartzite and greenstone first appear in the neighbourhood of Ahvenjärvi and Tchobin to the south-east. Between them lies the valley of the Kumsujoki, 55 metres deep, with steep sides. There are other, less important ridges south of Semtsijärvi. An extensive mountain group begins in the neighbourhood of the village of Keldose'kä. Its eastern arm ends to the east of Päljärvi, while its western arm can be followed along the west of Päljärvi to the neighbourhood of the village of Koikari on the Sununjoki, and thence onwards between Päljärvi and Vätsilänjärvi. On the south, north and eastern sides of this large group of mountains there are extensive low-lying bogs.

The region round the north-west of Lake Onega (34 m.) has peculiar characteristics, as is seen by a glance at the map. The northern part of the lake is broken up into fjord-like gulfs, with long, generally rocky, peninsulas between them. The same characteristics continue towards the west in valleys and ridges, to the western portion of the Päljärvi and Päläjärvi fell groups, and south of them to the western side of Munjärvi, Kentjärvi and Uksujärvi. The ridges reach a height of 100—150 metres above the sea. Several of the higher summits give an extraordinarily extensive view over this peculiar landscape and Lake Onega. Among such view-points may be named Suollusmäki near Petro-savodsk, Pyhäselkä on the shore of Santalajärvi, and Kurhananselkä on the northern side of Päljärvi. Many of the valleys are very fertile, partly because they are sheltered by ridges of rock and open towards the south, partly probably because the rock of that area, which is a calciferous greenstone, makes the soil fertile. The lakes are picturesque, with clear water, and abound in fish. The whole peninsula between the Gulfs of Kontupohja and Povenets, called Zaonezhje, is famous for its fruitfulness.

On the south-west shore of Onega there is a group of important heights

(over 150 m.). Otherwise the Olonets Isthmus between the Lakes Onega and Ladoga is fairly flat (50–100 m.), but varied, with now forest, now meadowland (clay) and bog, and then again undulating country with small hills (Fig. 22). Special mention must be made of the south-west glen of Säämäjärvi, 35 kilometres long, the sides of which are formed by low hills with steep slopes. This region is fertile in many parts, and comparatively thickly populated. In many places the forest between the villages has been cut down and burn beaten. One can travel tens of kilometres without seeing any trees except the fir groves in the village burial grounds. In many places sandy heaths stretch on each side of the boulder ridges.

On the other hand, the Onega Isthmus, between Lake Onega and the Gulf of Onega, lies rather higher. Here the ground rises to a maximum of 100–150 metres above the sea, but there are also plateau-like heights or small mountains which attain an altitude of 200 metres and more.

J. E. ROSBERG and P. ESKOLA.

2. The Coast.

The climate of the Carelian and Pomorian coasts is foggy and cold. Fog is frequent in the spring and summer (May–July), especially when there is a northerly wind. With southerly winds the air is generally clear. The cold fogs are less often noticeable on the inner shores of the Gulf of Onega than in Kandalaks.

The ice begins to form in November — off Kem often as early as October — and it generally does not melt until the end of May. (In the years 1899 and 1902 there was still fast ice on the coasts of East Carelia in June, and in 1911 and 1916 there were masses of pack-ice in that month). During the winter it is easy to get out over the ice to the nearest islands, and at many points the high-roads which follow the coast are straightened out by short cuts over frozen inlets. Further out fast ice seldom forms; the ice often drifts about the whole winter under the influence of gales and currents. It may often happen therefore that the Solovets islands, for example, are cut off from all communication with the mainland for several weeks at a time. The ice floes often pile up in high ramparts on islands and banks. Such piled masses of drift-ice have sometimes revealed the existence of new submarine shoals.

The interior has a general gradual inclination towards the coast, as is shown by the fact that the smaller water-courses run roughly at right angles

to the coast-line. The Uikujoki is an exception, running diagonally out towards the shore. This is due to the large glacial deposits which have closed the more natural course of this river. The maps also show that this river receives nearly all its tributaries on the left bank, scarcely any on the right.

There is in many respects a wide difference between the Carelian coast and the Pomorian. The *Carelian* coast falls only very slightly towards the sea, and even perceptibly rises in that direction, so that great masses of water remain inside the coastal belt in the form of extensive lakes and large bogs. At a distance of several miles from the coast the soil formations cease to cover the rocky foundation, which becomes more and more visible, giving the region a barren appearance. North of Kieretti in particular, the shore is dominated by cliffs. Only here and there does a wind-swept pine find a foothold in the barren gravel. Finally, in the innermost waters of Kandalaks, the cliffs and islands seem to be sky-high. They attain as much as a couple of hundred metres above the surface of the sea. The innermost reaches of Kandalaks have a fjord-like appearance, and somewhat recall the fjords of West Murman. South of Kieretti the coast gets lower and the archipelago less dominating. This archipelago makes the Carelian coast difficult of navigation. None but a native pilot can find the way. South of Kieretti especially, where the sounds are shallower and shoals more numerous, navigation offers great difficulties. The coast is stony, and in many places has a bank 10—20 metres high. Behind this loom the higher mountains of the interior. The shores are mostly covered with low, mixed forest growth; on the banks of the rivers and coastal lakes there are grassy meadows. The larger islands off the Carelian coast are stony and covered to some extent with moraine gravel and pine forest, while the smaller ones are bare granite rocks with tundra vegetation. The higher points on the coast attain an altitude of 85—105 metres.

The *Pomorian* coast is partly sandy (Fig. 23) and partly swampy. It has many gulfs in which rivers and streams debouch. Most of these river mouths offer good anchorage, at least for small vessels.

The water is clear and greenish on the Carelian coast, but in towards the Gulf of Onega it gets thicker, and assumes a leaden grey colour. It is exceedingly muddy outside all the river mouths.

This coast is less disturbed by high seas than the Carelian coast. South of the Solovets Islands the sea seldom runs very high, though it can be choppy, especially when the wind is in the north-west.

The sandy headlands and peninsulas extend under the water as reefs, which considerably add to the difficulty of navigation. This coast also has a



Fig. 21. Natural Meadows in the village of Maaselkã on Lake Seesjärvi. Province of Povenets.

Photo P. Eskola.



Fig. 22. Hilly Landscape at the Village of Veskelys, Säämäjärvi. Province of Povenets. All the slopes have been burn-beaten.

Photo P. Eskola.

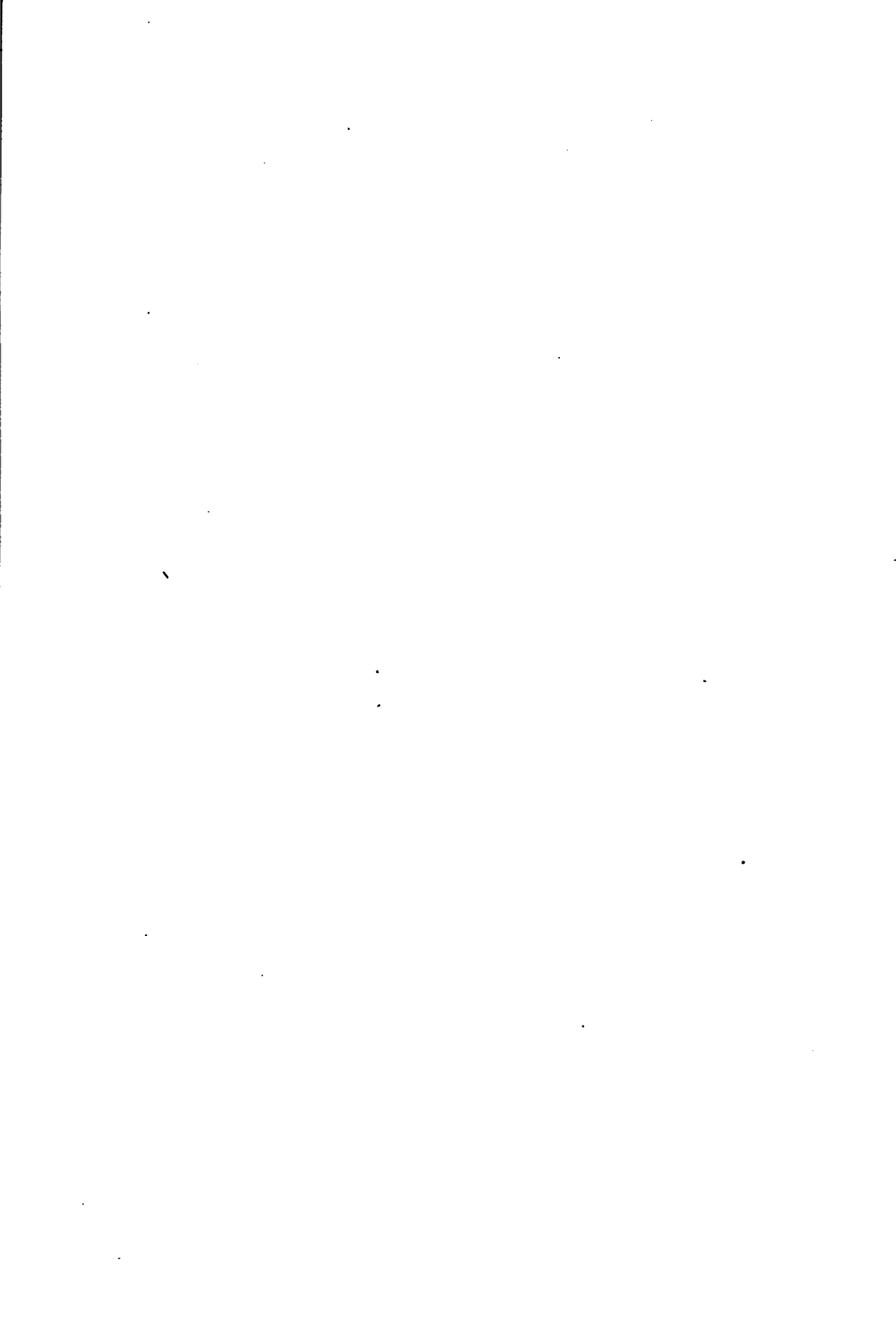




Fig. 23. Field of Sand and the Great Posting Road, near the Market Town of Suma. Province of Kem.

Photo I. Sourander.



Fig. 24. Oulanka River. Province of Kem.

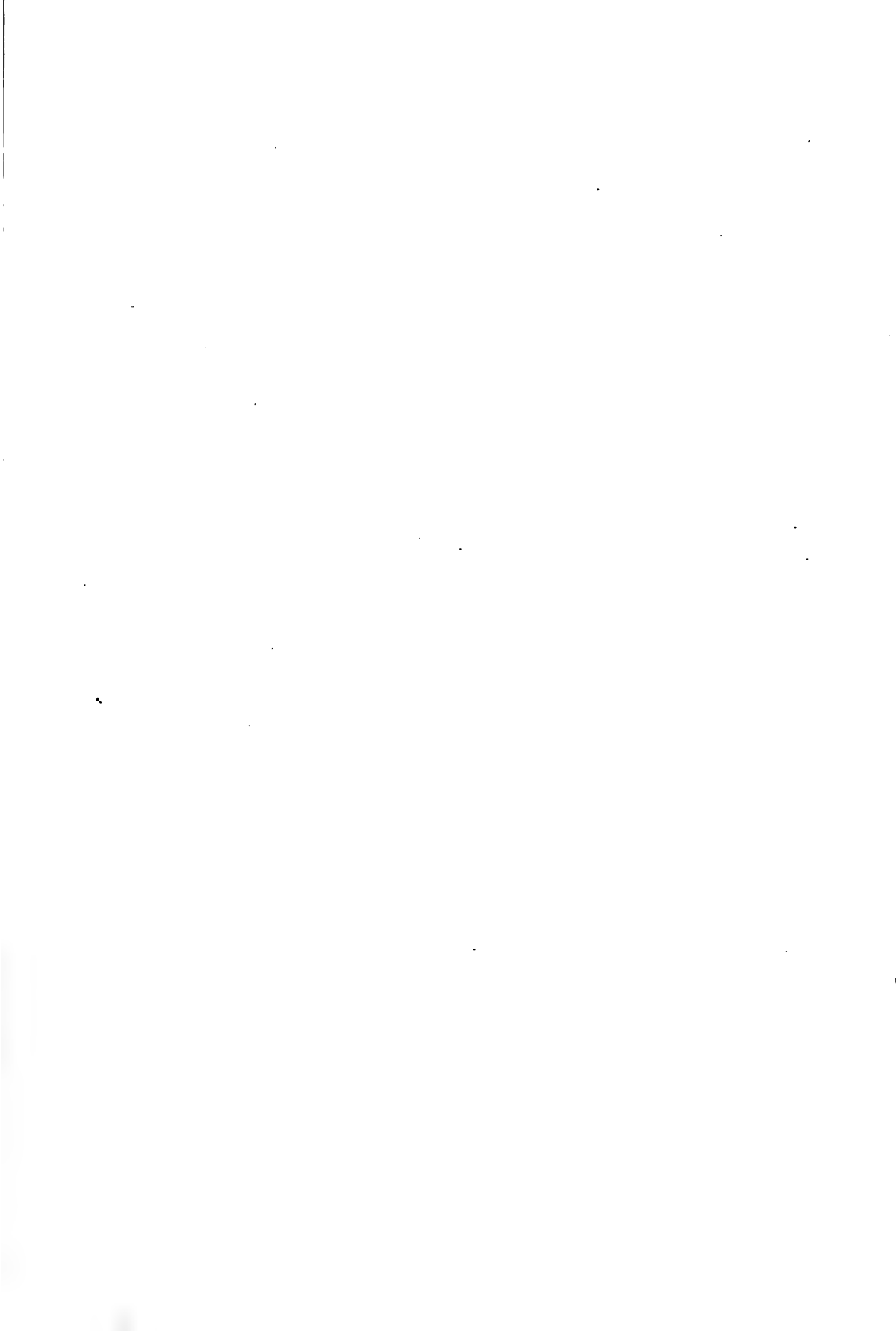
Photo J. E. Rosberg.



Fig. 25. Usmankoski Rapids, Upper Part, in the Kem River.
Photo I. K. Inha.



Fig. 26. Village of List pohja, on Lake Seesjärvi. Province of Povenets.
Photo P. Eshola.



fairly numerous archipelago, which cannot, however, be compared in magnitude or wild majesty with that on the Kandalaks coast. The Solovets Islands properly belong to this archipelago. In many places the islands are moor-like. Half way between them and the mainland there begins a complicated archipelago of low islands and islets with stony shores. This, which is called the Kem archipelago, continues southwards in a string of islands towards the Gulf of Onega. These groups of islands are generally called the Suma Archipelago, outside the mouth of the Suma, and the Onega Archipelago further down in the gulf of that name. The larger of these islands are covered with forest, while the smaller ones are bare, and have the tundra vegetation. Inside the line of this archipelago there are large, shallow bays with low islands here and there, especially close to the coast. At low tide these are often joined together, while at high tide the sea rises high up on their shores. The old coast line shows that the sea once came higher up in East Carelia, and it seems as if it had recently begun to rise again. The whole archipelago gives the impression of cut up land or sea bottom, and the coastal belt is very boggy. The very extensive coastal bogs are only passable where wooden causeways have been constructed over them, or where two hewn logs have been placed side by side to form foot-bridges.

The changes of the tide are very marked, especially on the shallow Pomorian coast. Many of the river mouths, for example those of the Kem and Uikujoki rivers, are inaccessible to larger vessels at low tide, and a number of sounds are then innavigable. The spring tide is 1.2—2.4 metres high at the town of Kem. There is often a strong current between the Solovets Islands and the mouth of the Kem river, caused by the tidal water. When the flood tide at the Kem Islands meets the ebb between these and the Solovets Islands, there is a strong but short tidal wave which can be dangerous for small boats. Even between Kem and the monastery the steamer is often delayed to some extent by the currents and conflicting waves. At high tide with a wind off the sea, the boats have to be drawn up high on the shore, to be out of the way of the waves. The tides also produce currents in narrower sounds between the islands. There is no sudden turn of the tidal current here as in the «throat» of the White Sea. Northerly and north-westerly winds increase the height of the tide and diminish the ebb; southerly and south-westerly winds on the other hand drive the water off the shore. At the mouths of the Kem river, the Uikujoki and other large watercourses, fresh water collects and floats for a time on the surface. This surface water, which is caused by heavy rainfall, tends to weaken the flood tide and strengthen the ebb. — The variation of the tides

on the Carelian coast is about 2 metres. The tide comes in here from the north-north-west. The mouth of the Kem river is so shallow that the steam boats stop outside off the great sawmills. The traffic between them and the town is served by large rowing boats. The shallow shote of the Gulf of Onega, especially, is left dry at low tide, large expanses being uncovered and sandbanks appearing all over. (For the vertical height of the tide see p. 12 in the chapter on the sea). The tides are perceptible for several kilometres up the mouths of the rivers, and in some of them cause varying currents up- and downstream. The currents on the East Carelian coast have however as yet been little studied.

J. E. ROSBERG.

3. The Inland Waters.

The distribution of water in many parts of the territory strongly recalls that seen on the Finnish side of the frontier. Here too there are numerous lakes, large and small, which group themselves in systems. Their waters gather in some central lake, and drain thence by some river down to the sea. Near the coast there is a large number of smaller streams. The long and narrow lakes and inlets of the north-west coast of Lake Onega, the Zaonezhje Peninsula, are quite peculiar from a hydrographical point of view. The water seldom runs far in the same valley, but in many places where glacial formations have blocked its course, has broken its way through into another valley running parallel.

In many parts of East Carelia there are no clearly marked watersheds, and the people declare that the water systems are connected by bogs. No bifurcated rivers or lakes worth speaking of are known, however. (1) In marshy areas there are a number of small, bog-lakes without visible outlet.

The *shape* of the lakes depends chiefly on the structure of the rock foundation, and sometimes also on glacial deposits. In the granite area the lakes are capriciously irregular. Koutajärvi, Ontojärvi, Uikujärvi and in the south Säämäjärvi may be mentioned as examples. In the slate districts the lakes generally lie with their length following the direction of the rock formations, and a glance at the map shows that both in the south of East Carelia and in

(1) It is true that in many places the maps show double outlets to the lakes, various forked rivers, and a large number of lakes without any outlet. All this is erroneous. The shapes of the lakes also are often, as already mentioned, completely misrepresented on the maps.

Finnish Carelia the typical direction is north-west to south-east. Further north, in the province of Kem, the lakes mostly lie with their length running east and west, as in the Kuusamo district of Finland. There are in East Carelia a large number of lakes imbedded in moraine or other soils, whose shapes are thereby affected. Seesjärvi is in its way unique. Although this lake is surrounded on practically every side by quartzite and other slate formations, it is almost square in shape, and almost devoid of islands. An open inland sea like this is unusual in Finland, if its counterpart is to be found at all.

It is probable that this lake is in a comparatively recent depression, as is also suggested by the fact that it is unusually deep, 99 metres.

Otherwise, the *depth* of the lakes varies very much. The East Carelian part of Lake Ladoga is comparatively shallow, the greatest depth (260 metres) lying to the west of Valamo, but the northern parts of Lake Onega can show fairly considerable depths (maximum 130 metres). The Seesjärvi basin is also, as stated, very deeply depressed. Among the northern lakes, Pääjärvi is (according to Nordqvist) 34 metres deep, Yli-Kirkajärvi 28 metres, Koutajärvi 37 metres, Soukelojärvi 10, Kuukasjärvi 61, Mossanjärvi $17\frac{1}{2}$ and Lapinjärvi 22 metres. Rosberg has noted the following among comparatively deep lakes in the central regions; Lupajärvi, Matkajärvi, Kaunisjärvi, Tjaisjärvi, Talveisjärvi, Palojärvi, Voijärvi, Syvälampi, Unusjärvi, Jolmajärvi, Kaitajärvi and Tuoppajärvi. Several of the Zaonezhje lakes are fairly deep. On the other hand, shallow lakes are perhaps more common than on the Finnish lake plateau. The shallow lakes are often full of islands. It is said of many of these island-studded lakes, such as Uikujärvi, that «They have as many islands as there are days in the year, and one over».

Most of the lakes have dark but clear bog water. The long, deep mountain lakes such as Voijärvi and Jolmajärvi have clear, transparent water, as also have the lake arms of Onega, such as Santala and Päljärvi. Still clearer water is found in the lakes in hog'sback country or on sandy heaths.

In the innermost corner of the *Kandalaks Fjord* the river Kammanjoki has its mouth. This river, which at times is of very great volume, rises in the northern slopes of Kaitatunturi, and unites with the Ripinä which rises on the southern slopes of the same group of fells. The upper reaches of both rivers contain many rapids. The Kouta system is drained by a river 200 metres wide which debouches at Kouta. The central lake of this system is the huge Koutajärvi (according to Strelbitski 584 sq. km. in area). This lake receives on the west the waters of the mighty Pääjärvi system through the Tuntsajoki, on the south the Tyllinjoki system and on the north-west the Tovantojärvi

system, which gathers its tributaries from the mountain streams of the slopes of Kaitatunturi. The Tyllinjoki system consists of a series of lakes, among which may be mentioned the deep, fjord-like Kuukasjärvi. The Pääjärvi system brings down much water from the Finnish side, by the Oulankajoki (Fig. 24). Near the frontier this river forms a number of rapids, among which may be mentioned Niskakoski, Vääräkoski, Peurakoski, Kivakkakoski (Fig. 19). It is about 50 metres wide, and recalls Vallinkoski, below Imatra) and Puvaskoski. Pääjärvi has an area of 560 sq. km. and is considered to be one of the most beautiful lakes in the north. On the south-east it receives the waters of the river Tuoppajoki, which runs out from the clear lake Tuoppajärvi, a lake which, with its area of 1065 sq. km., is as large as an inland sea. In many places the land of the opposite coast is not visible from the shore, and the waves run as high on this lake as on the sea, but are much steeper and more feared. Shortly after the Tuoppajoki leaves this lake it forms a perpendicular waterfall, Lohjenankoski which according to Fries is many metres high. Boats have to be dragged past this rapid on logs of wood. The Tuntsajoki contributes to this water system a large volume of water from northern Kuolajärvi and its high fells. This river also contains a number of difficult rapids, the largest of which is the Kuma, in the valley of the same name.

The river *Kierettijoki* runs out at the village of Kieretti, after draining two large lakes (one of which, Kiertinjärvi, has an area of 404 sq. km.) and a whole series of smaller ones. The Kalkajoki runs out at Kalkalahti, bringing the waters of Enkijärvi (274 sq. km.) and several smaller lakes. The Ponkamajoki runs out at Ponkamo, after draining a series of lakes which forms the natural continuation of the Tuoppajärvi basin, but has been cut off from it by bog and glacial deposits. At the time of the spring floods Tuoppajärvi and Leiviskjärvi, which belong to the Ponkamajärvi system, exchange their waters. The surface of Tuoppajärvi has been lowered by erosion in the precipitous waterfall of the Tuoppajoki river, so that its shores are now low.

The *Kem* water system, which according to Strelbitski is 405 km. long and drains an area of 31,499 sq. km., runs out at the town of the same name, and has Jyskyjärvi for its central lake. The river Kem is magnificent. It can perhaps best be compared with the river Iijoki in Finland. Its valley is not very deeply carved. Its banks are sandy or stony and often turn into open bog at a little distance from the river. Here and there the river expands into wide reaches, bordered by pleasant meadows and rich deciduous vegetation. There are at least twenty large rapids between the central lake and the mouth, and several of them are five or six kilometres long. The largest is Usmankoski

(Fig. 25), famous for its salmon fishing. For the first eighteen or nineteen kilometres above the town of Kem, the river practically consists of a single strong current, which makes punting up stream fairly difficult. The spring flood often overflows the banks, and occasionally damages houses in the town. In the middle of the summer the water gets comparatively low. The river is broad and shallow at Kem, but has a fairly strong current. On its left bank it receives the waters of the Kepajoki system and the Sompajoki system, and on the right bank the Voijärvi system, which drains a number of moraine lakes. Some miles to the south of the lower end of Jyskyjärvi, the Kemjoki flows through the little lake of Paanajärvi.

Lake *Jyskyjärvi* drains two large systems, those of *Kuittijärvi* and the *Tchirkkakemijoki*. The former draws its waters from the three large *Kuittijärvi* lakes, of which the two lower, *Keskijärvi* (494 sq. km.) and *Ala-Kuittijärvi* (238 sq. km.) lie end to end like two long scoops, while the upper one, *Ylä-Kuittijärvi* (291 sq. km.) lies rather more to one side, and according to Inha, is more divided into a number of arms. Draining into this lake there are the *Pistojoki* (which abounds in pearl mussels) rising in *Kuusamo* and flowing through *Pistojärvi* (205 sq. km.), the *Kursmanjoki* and the *Latvajärvi* and *Livijoki* systems, both of which rise in lakes on the frontier. The lake *Ylä-Kuittijärvi* empties itself by a short but swift stream into *Keski-Kuittijärvi*, which then receives the *Kenttijoki* system from the south. *Keski-Kuittijärvi* is connected with *Ala-Kuittijärvi* by the sound of *Luusalmi*, and a short river with three rapids leads from the latter lake to *Jyskyjärvi*. The three *Kuittijärvi* lakes are in many places so wide that the opposite shore cannot be seen.

The *Tchirkkakemijoki* is a picturesque river about 200 kilometres long and fairly swift; — between *Tchirkkakemby* and *Jyskyjärvi* there are 40 rapids, though a number of them are fairly insignificant. The banks are mostly sandy (moors, moraine land and hog'sbacks), and in places also swampy. From the west it receives the *Kivijärvi* system, the most important lakes in which are *Kivijärvi* (245 sq. km.) and *Njuokkijärvi*. There is a narrow valley between *Kivijärvi* and *Luvajärvi* in which the river forms some thirty rapids, the most magnificent being *Laippa*. The scenery here vies in beauty with that of northern *Kuusamo*. *Njuokkijärvi* (206 sq. km.) sends its waters down to the *Tchirkkakemijoki* by two channels, the *Rastahanjoki* and the *Hämehänjoki*, which encircle the long, sand and moraine gravel island of *Nuokkisaari*. The *Tjolmajärvi* system flows into the *Tchirkkakemijoki* through the *Lietmajoki* a little to the south of the confluences of the above mentioned rivers.

At Suiku, between Kem and Sorokka, there is the outlet of a small system draining Suikujärvi and a few smallish lakes.

The *Uikujoki* gathers its waters in north-east Olonets, and debouches at Sorokka. Its central lake, Uikujärvi (861 sq. km.) is large, island-studded and surrounded by moors. Into it flow the Voshma from the east, the upper Uikujoki from the south-east and the Sekehenjoki, which comes from lake Seesjärvi from the south-west. The Uikujoki is the longest of these. It, like the Voshma, rises in the bogs east of the frontier of the province of Povenets, and then flows towards the north-west.

Seesjärvi (1,246 sq. km., Fig. 26), the pride of East Carelia, is the largest and most picturesque lake in this system, and is likely to attract a denser population to its shores in time to come. It lies sunk in a rocky basin, and is fed only by fairly short systems. Among these may be mentioned the Suontenljoki, which gathers its waters far in in the great waste, and is connected by a stream which sometimes runs in one direction and sometimes in the other with the wonderfully beautiful, peak-enclosed lake of Voijärvi. A contributory system is the Selki, which draws its waters from Semtsijärvi, Jänkäjärvi and Unojärvi, and the central lake of which is Selkienjärvi. Seesjärvi empties itself into Uikujärvi through the magnificent river Sekehenjoki, which contains a number of rapids. The Povenets Gulf of Lake Onega can be reached from Seesjärvi through a series of small lakes and streams, and by dragging the boats over narrow necks of land.

The river Vyg, or *Uikujoki*, (409 km. long, draining an area of 26,344 sq. km.) flows out in the Gulf of Sorokka, and although rather swift in many places is navigable for the greater part of its course. Near lake Vyg (Uikujärvi) is the precipitous, six metre high waterfall of Vojatsukoski, one of the highest and most splendid waterfalls in East Carelia. (Fig. 27). Boats have to be dragged over land past this and another large fall in the same river, Schardno, twelve metres high. Below this fall the river widens out into lake Vojatsujärvi, and below this again, as far as the confluence of the Ontajoki, there is a succession of rapids. Nearly the whole of the lower reaches are navigable for boats. Near Sorokka the river divides into several arms, which contain smaller rapids. In the arm on which Sorokka stands there is a channel 1.3 metres deep. Outside the delta there is a sandbank which changes its position and height each year after the ice melts. Steamboats generally anchor at some distance from the land, and communication with the village of Sorokka is maintained by motorboats. As stated above, this river receives most of its tributaries on the left bank. The longest of them is the Ontajoki, which debouches

into Ontajärvi (179 sq. km.) from the north-west, and flows through that lake, while the Kuusiniemi system feeds it from the south-west, coming from Jolmajärvi, a narrow lake enclosed between hog'sbacks. Other tributaries of the river Uikujoki include the Onigmajoki, the Kivijoki and the Tungujoki.

The *Sumajoki* flows out in the Gulf of Suma, after draining a number of largish lakes. Its meandering curves are in many places eating into the moors over which it flows. At high tide this river is navigable for small vessels. It is about 100 metres, and at the mouth, near the town of Suma, 140 metres wide. Outside the mouth there is a sandbank over which the water is at times only $1\frac{1}{8}$ metres deep, but inside this the depth is 3.7 to 5.5 metres. The first rapids (going up-stream) are just above the town. It is from this river that communication with Lake Onega has been suggested, by means of a canal (about 60 km. long) and through a number of lakes. Unfortunately, however, the river freezes in the end of October, and is not ice-free until May. The breaking up of the ice is not especially difficult, although the river flows northwards, as the ice-floes get broken up in the rapids. The other streams on the coast drain the large bogs beyond the coastal belt.

The fjord-like northern arms of Lake *Onega* (9,751.6 sq. km.) are continued in the same direction by valleys and long, narrow lakes. Many of these are exceedingly picturesque, with their high banks, which are partly forest clad and partly rocky. The river Kumsujoki flows into the northernmost arm of Lake Onega (the Gulf of Povenets) from Kalakumsujärvi and Kumsujärvi, with the magnificent Buhma rapids, below which it runs in a south-easterly direction through a deeply cleft valley. As the valley is more than 50 metres deep, the tributaries of the Kumsujoki make high and precipitous falls at their confluences. The chief of these tributaries is the Osterjoki, which comes from northern Osterjärvi.

The long river *Sununjoki* rises on «Maanselkä», near the lakes where the Pielisjärvi system begins, and flows out in the Gulf of Kontupohja. The lakes of Motkojärvi, Soimijärvi and Koutajärvi belong to one arm of this system, and Lupajärvi and Vonkerijärvi to the other. The largest lake in the system is Himolanjärvi. The river Sununjoki is famous for its three great rapids, Hirvas, Porokoski and Kivatsu (Kivatch). The two first-named lie close together above Sununjärvi, while Kivatsu is below that lake. This last rapid has a fall of 15 metres, and its force is estimated at 26,000 horse power, Kivatsu is much frequented by tourists and much sung by poets (Dershavin, Grave, etc.) The force of Porokoski (Fig. 28) has been estimated at about 38,000 horse power, but this figure is unquestionably too high. The rapids are about half a kilo-

metre long, and somewhat recall Imatra. It may be mentioned for the sake of comparison that Imatra has 141,312 horse power at the average height of water. Below Kivatsu the Sununjoki is joined by the Santalanjoki, which drains Santalanjärvi (296 sq. km.) It is a curious natural phenomenon that although the southern end of Santalanjärvi lies only a few kilometres from the innermost corner of the Gulf of Kontupohja, the water does not flow directly out into that gulf, but makes its way into another valley, through which the Sununjoki flows close beside the lake, and parallel to it. A fine project has been planned and already partly realised, for the utilisation of the water-power in this river. The project is to dam up the Sununjoki below Sununjärvi but above Kivatsu, and lead its waters to Santalanjärvi by a canal. The river which now drains that lake would then also be dammed at the confluence, and the water be led from Santalanjärvi by an artificial fall direct to Kontupohja, where a factory would then be planted. It is proposed to establish a factory for making saltpetre out of the nitrogen in the air by means of electricity. By this means the water-power of Kivatsu would be transferred to Kontupohja, and added to it would be the water from Santalanjärvi, increased by the river which drains Päljärvi and debouches into the northern end of Santalanjärvi. This river flows out from the northern end of Päljärvi and along that lake close beside its eastern shore. Thus the rivers which drain both Päljärvi (1) and Santalanjärvi furnish examples of the peculiar hydrographical features of the Zaonezhje Peninsula referred to in the beginning of this chapter.

The river *Suojoki* (or *Šuojou*) flows out in the Gulf of Petrosavodsk. Quite near to its mouth it receives on the left bank the waters of the Uksujärvi system, to which belong Munjärvi, Pertjärvi, Kentjärvi and Uksujärvi. Pertjärvi and Kentjärvi lie end to end in the same long valley, separated from each other by a ridge of boulder stone, while the others lie further to the south, and the rivers which drain them also break out sideways from their valleys. The Torasjoki is the arm which really forms the source of the Sununjoki, and its largest drainage basin is Suojärvi, in Finnish Carelia. The Suojoki forms many rapids during its course through the province of Olonets, but only one of these (before it flows into Vahatjärvi) is so dangerous that it cannot be traversed by boats. The Suojoki flows through the picturesque lake Suotjärvi. Vahat-

(1) The natural continuation southwards of Päljärvi would be Sununjärvi, from which it is divided by a massive formation of boulder-stone and gravel.



Fig. 27. Vojatsunkoski Rapids in the Uikujoki (River Vyg). Village of Vojatsu in the the background. Province of Kem.

Photo P. Eskola.



Fig. 28. Porokoski Rapids (Left Arm) in the Sununjoki.

Photo P. Eskola.

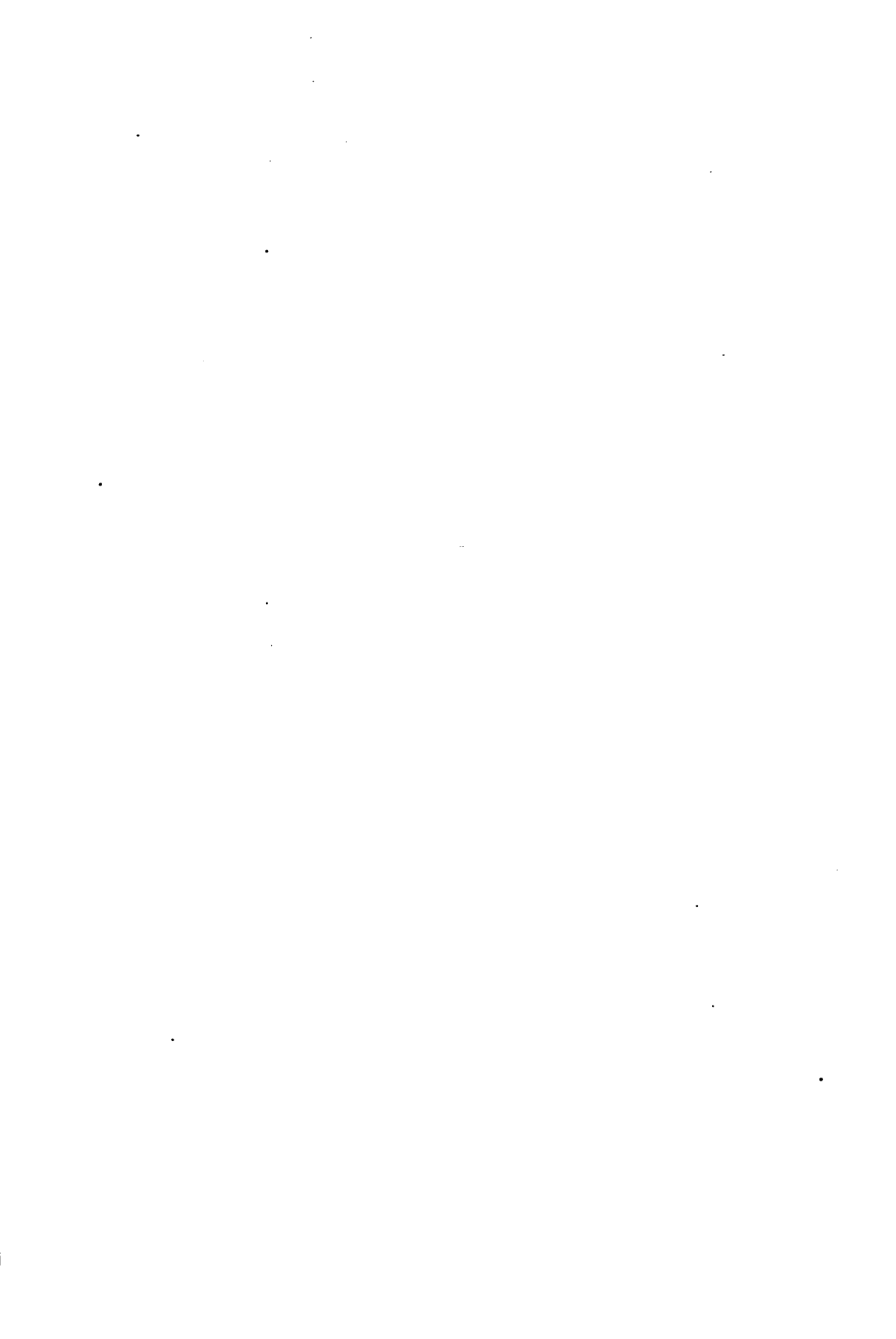




Fig. 29. Mountain of Greenstone beside Lake Päljärvi.
Village of Pyhäniemi, Province of Povenets.

Photo P. Eskola.



Fig. 30. Pit for Working Copper Ore at the village of Pyhäniemi.
and a Workman from Pyhäniemi, Province of Povenets.

Photo P. Eskola.

järvi is fed by the Tsäpjoki, from the large but shallow lake Säämäjärvi (Siäm-järvi).

The mountain range west of Onega forms the watershed towards the Ladoga slope. Only short streams flow from this watershed into the former lake, while long, winding rivers make their way to Ladoga or the Svir. Among the latter may here be mentioned the Vashinka, which flows into the Svir, and the Alavoisenjoki, which goes to Ladoga.

The *Svir* flows fairly calmly over bogs or moors. An enthusiastic writer says that the traffic on this river is so lively that »its like cannot be found in all Europe».

Finally must be mentioned the water courses which make their way into *Finland*. The Tulemajoki runs from Tulemajärvi down to Ladoga. The large lakes of the Lieksa system lie in a well-marked basin, and among them may be named Roukkulajärvi, Lieksajärvi (242 sq. km.), Koroppi, Tuulijärvi (280 sq. km.), Suulajärvi, Saarenjärvi, Aimojärvi, Lentierajärvi and Alanenjärvi. The waters from this basin fall into Pielisjärvi by the Lieksajoki, which forms four fairly difficult rapids on its way, and the sharp bends in which to north-west and south-east are caused by the well-marked ridges.

J. E. ROSBERG and P. ESKOLA.

4. The Rock Foundation and Soil.

From a geological and geographical point of view East Carelia and the Kola Peninsula both belong to Fennoscandia. The rock foundation of these regions is the direct continuation of the rock foundation of Finland. The rocks there as in Finland consist of gneis, granite, and crystalline slates. As in Finland, the hard rock foundation is mostly covered by loose formations of gravel, sand, clay and peat. In the south-east and the east these old rock foundations sink below the palaeozoic and later deposits of the Russian plain. There Fennoscandia borders on an area of a completely different geological nature. The boundary runs on the Carelian Isthmus from near the mouth of the Systerbäck to Kiviniemi rapids in the Vuoksen. Between Ladoga and Onega it runs from the neighbourhood of the town of Olonets to near the place, where the Svir leaves Onega, and from the eastern shore of Onega it runs some distance south of Pudosh in a long curve to the east towards the mouth of the Onega river, (see the appended geological map).

This old rock foundation, which belongs to the pre-cambrian geological period, can be divided into two main parts, (1) ancient primeval rock, which

everywhere forms the common foundation, and (2) more recent cambrian formations, found in scattered localities.

The *primeval rock* in East Carelia and Kola, as in the eastern parts of Finland, is mostly composed of granite and granite gneis. Mica-schist and other schists proper are rare. Round Kandalaks there is an extensive area of garnet amphibolite. Among the more recent pre-cambrian formations in East Carelia, Finnish geologists have distinguished various groups of different ages, which they have called by the following names; Jotnian, Onegian, Jatulian, and Kalevian. The most recent of these is the Jotnian division, which appears over an extensive area west of Lake Onega, from the Svir to Petroskoi. Its main portion is composed of red sandstone, the beds of which lie fairly horizontally. Diabase has penetrated between the beds. Similar sandstones are found at places in Satakunta and elsewhere in Fennoscandia.







The Onegian, Jatulian and Kalevian groups resemble one another, and are all more or less folded and schistous. To these belong quartzites and conglomerates, phyllite, dolomite, and a lot of greenstone, which originally either penetrated between the beds of quartzite or distributed itself in volcanic formations. All these formations appear in long-drawn-out stretches between tracts of primeval rock. The chief areas are west and north-west of Lake Onega in the government of Olonets, and in the government of Archangel, within an area stretching from Uikujärvi in the south to near the Kem river. Extensive Jatul-Kalevian areas extend their ramifications towards the White Sea side; here we find the Kivakka and Päänuorunen tundras of diabase, which geologically belong to the Jatulian greenstones. It must be remembered that similar Jatulian and Kalevian formations are exceedingly common in Finland, both in Carelia and in northern Ostrobothnia and in Lapland.

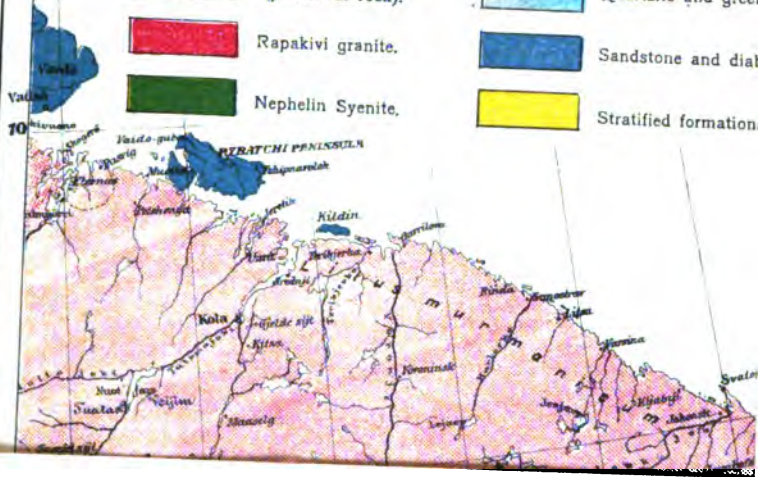
The *Soits* are of the quaternary period, and in the main the same as those in Finland. On the Carelian Isthmus as well as on the isthmus between lakes Onega and Ladoga in the southern portion of the Petrosavodsk sandstone district, the layers of soil are so deep that the rock foundation is nowhere visible. The commonest everywhere are moraine gravel, boulder gravel and sand. Clay soil is found in low-lying ground in the neighbourhood of Ladoga and Onega, but the clay-fields do not rise nearly so high above the sea level as they do in Finland, owing to the fact that in these regions, on the border of Fennoscandia, the rise in the level of the ground after the Ice Age was less considerable than in the interior of that area. Bogs and fens are frequent everywhere. In the province of Kem especially, the low-lying coasts of the Gulf of Onega spread in open fens as far as the eye can reach. The layer of

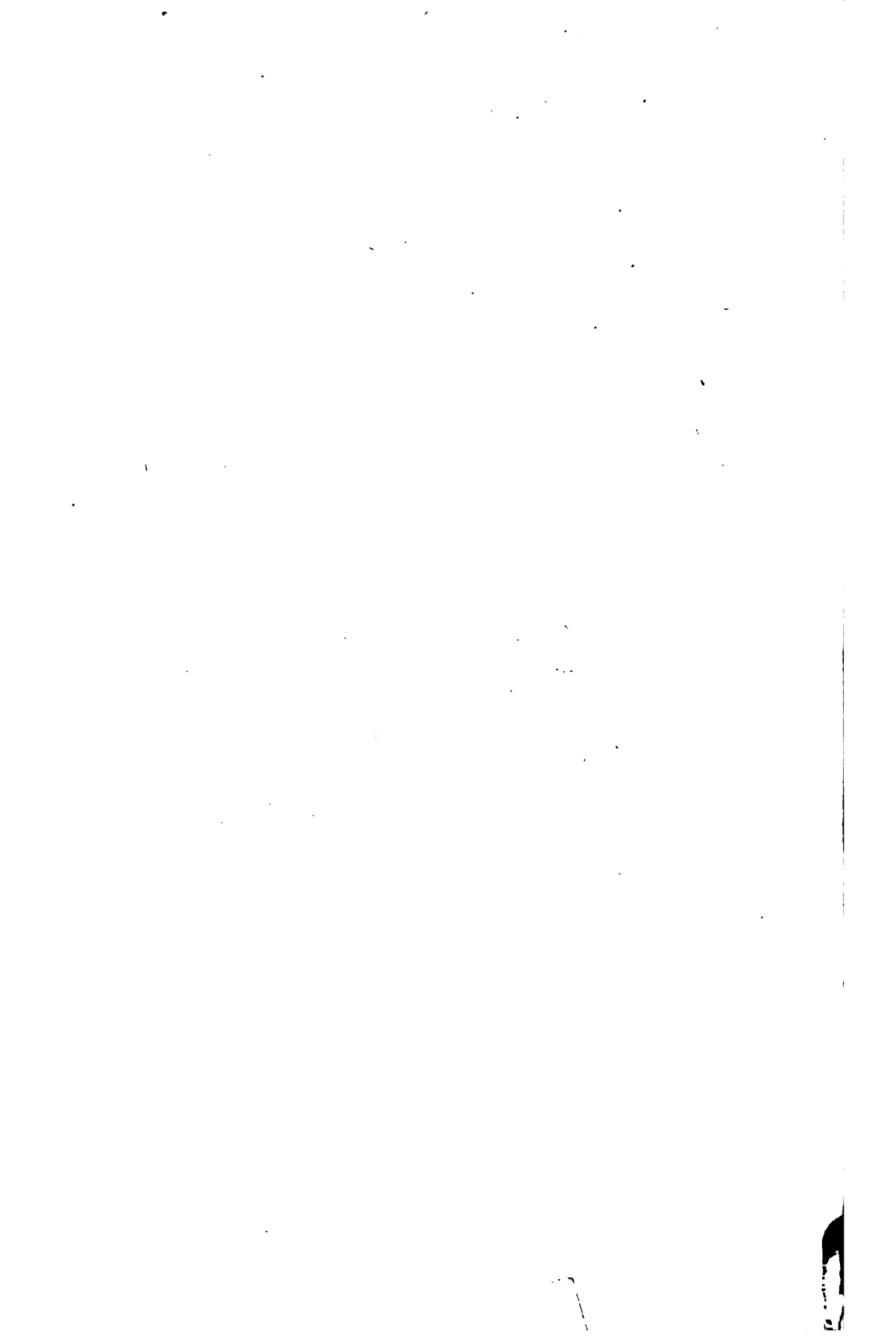
48 50 52 54 56 58 60

GEOLOGICAL MAP OF EAST CARELIA AND KOLA LA

Reference to colours.

- | | | | |
|---|---|---|-----------------------|
|  | Granite and gneiss
(primaeval rock). |  | Quartzite and green |
|  | Rapakivi granite. |  | Sandstone and diab |
|  | Nephelin Syenite. |  | Stratified formations |





peat is, however, comparatively shallow, and under it lie large deposits of clay, which are common all over the coast of the White Sea, but are not found much above sea level. Further to the west in the province of Kem there are high-lying summits covered with moraine gravel, where in a few places the rock becomes visible. Near Sorokka the boundary between the marshy plains and the undulating gravel country runs about fifty kilometres from the coast. Further to the north the high gravel country draws nearer to the coast, and the undulating surface reaches the coast near Kem.

The *configuration* of East Carelia is clearly influenced by the rock foundation, and to a lesser extent also by the soils. The different parts of the country correspond fairly closely with the different parts of Finland on which they respectively border. The region east of Ladoga in the south is broken country, as the character of the surface is determined by the small irregularities caused by moraines and other glacial formations. In the sandstone region west of Lake Onega the configuration is shaped by the rock foundation. Diabase tracts rise as rocky plateaus above this sandstone region.

Further north, the region of primeval granite and granite gneis is in the main level, while the Jatulian and Kalevian districts are much more uneven. Here the stretches of greenstone and especially quartzite form long ridges, the valleys between which rest on foundations of phyllite and dolomite and also primeval rock. The difference in level between the summits and the valleys is at most 150 metres. A specially striking example is the valley of the Kumsujoki, which is about sixty metres deep, with precipitous sides.

The gneis region on the west coast of the Gulf of Onega is very low-lying and level. Further to the west, in the Jatulian region, there are ridges and deep valleys. The land gets gradually higher towards the north, and on the Kandalaks Fjord even the regions of primeval rock are high and mountainous.

In Olonets Carelia and White Sea Carelia, as also in eastern Finland, high-lying land is cultivated by preference. As the rock foundation of the highlands is generally of quartzite or greenstone, it follows that these, and other rocks of more recent formation than the primeval, are often found near the villages, while the primeval rock must be sought in the extensive, boggy, low-lying wastes. But there is an other reason beside the configuration which makes the former regions more suited to cultivation; they are more fertile. Luxuriant vegetation is always found in dolomite regions, and the greenstone

districts seem even more fruitful, as this rock contains calcium carbonate as well as other substances on which plants feed. A comparison of maps showing vegetation with maps showing the rock foundation reveals that schist regions of more recent formation than the primeval rock are often particularly fertile.

Owing to the peculiar geological history of the country, the water courses of East Carelia are still in an early stage of development. This is shown by the large number of lakes and rapids. These last are sure to be a great source of wealth to the country in the future.

W. RAMSAY and P. ESKOLA.

5. Useful ores, other minerals and stones.

Ever since the time of Peter the Great there has been eager search for ores in Olonets and the government of Archangel. The search has been stimulated by the fact that a solid rock foundation has been found here similar to that in the Urals which has proved so rich in metals. For a couple of centuries therefore, exploratory and trial workings have been made in Carelia to an almost incredible extent; foreign experts have often been employed to investigate these regions and their deposits of ore. In the time of Catherine II. the Austrian COUNT HARSCH investigated the whole of the government of Olonets, and under Alexander II. similar investigations were carried out by the Balt VON HELMERSEN, not to mention many others. All the workings and investigations, however, have given equally negative results. Von Helmersen concludes from his own observations and those previously made, that no iron, copper or gold ore of any value will ever be discovered in Olonets.

The deposits of ore in Olonets and on the White Sea can be classified into clearly distinguished groups, which are here enumerated.

(1) *Veins containing copper ore.* These consist of veins of quartz-limespar occurring in connection with the greenstone (Fig. 29), which contain some copper pyrites, variegated copper ore or sulphide of copper, and sometimes also galena or zinc blende. These deposits of copper ore are very common, and astonishingly determined attempts to work them have been made. The present writer has counted, during two summer excursions in Olonets alone, no less than thirty-seven such worked deposits (Fig. 30). In several there has been quite a lot of blasting, and shafts and tunnels have been constructed. In the south of the government of Archangel similar work has also been done, but the enterprises have not paid anywhere, as the veins contain inconsiderable and irregular quantities of metal.

One deposit at Vojatsu at the northern end of Uikujärvi contains *gold* as well as copper ore. This has led to a lot of mining in that place. In some parts of the mine, gold has been found in comparative abundance and fairly large nuggets, but lower down it entirely ceased.

In view of the nature of these deposits, the present writer can entirely associate himself with the pessimistic verdicts of von Helmersen and other older experts. We can in this case also quote the experience gained of similar ore deposits in Finland, belonging to the same group. Such deposits are very frequent in this country, as for example at Kontiolaks, Fno, Pudasjärvi and Kuusamo, but in all these work has shown very little return.

(2) *Copper ore in quartzite.* The deposits of copper ore at Voronov-bor, on the northern end of Lake Onega, are in their way peculiar. A layer of quartzite twenty metres deep is here penetrated with copper pyrites and bornite, so that the stone itself sometimes contains three per cent of copper ore. In spite of von Helmersen's assertion, a deposit like this may be worth working, if the ore proves to be sufficiently abundant. No very high metal content can, however, be expected.

In some places in Olonets, quartzite-blended copper ore has been found in loose blocks, which do not seem to belong to the veins. Outokumpu, in Finnish Carelia, where also copper ore is found in quartzite, shows that such deposits can be productive; it should be noted that the geological formation of the southern part of Olonets and White Sea Carelia is of the same nature as that in the Outokumpu district.

(3) *Deposits of iron ore.* North of Tulemajärvi in the Province of Olonets, about fifty kilometres north-east of Ladoga, there are numerous deposits of iron ore in dolomite strata. The ore is iron or hematite (Fe_2O_3) and very pure. The depth of the strata varies from a few decimetres to several metres, and their position varies, but is mostly in long slopes, which makes working more difficult. The general direction is fairly constant, but in detail it sometimes varies capriciously. The strata are found in four different layers, each of which seems to continue unbroken for about ten kilometres. The working has been carried so far that the outer portions of the ore strata, in the rocky regions where they were exposed from the beginning, have been blasted away. The work did not pay, and the structures have been allowed to fall into decay. The present writer is, however, not convinced that the reason of the poor result lay in the deposit itself. It is true that the Finnish expert, O. TRÜSTEDT, who investigated these deposits, did not give great hopes of their yield, because the strata are so shallow and their course and inclination so capricious. But in view of the good quality of the ore, and the fact that it occurs unin-

erruptedly for a considerable distance, it is impossible not to suppose that, in spite of all, there is here an opportunity for scientific mining adapted to the conditions. The prospects would naturally be improved if the railway already planned from Sordavala to Petrosavodsk, via the neighbourhood of Tulemajärvi, should be constructed.

Similar iron ore strata have only been found elsewhere at Suojärvi in Finland. Hematite occurs in veins in the neighbourhood of Koikari in Olonets, but these veins are inconsiderable.

(4) *Bog-ore*. Iron ore occurs in several of the Olonets lakes, as it does also in those of east Finland. There too it has previously been worked in considerable quantities. Bog-ore smelting works have existed at Kentjärvi in the province of Petrosavodsk, at Valamo in the province of Povenets, at Orajärvi and at Suontelo west of Seesjärvi. The last-named smelting works have been started again during the war, and the establishment of others has also been considered. In time of peace, iron manufacture employing bog-ore could scarcely pay.

We append an enumeration of other useful minerals and rocks occurring in Russian Carelia.

(5) *Coal*. A stratum of anthracite (so-called schungite) two metres deep has been discovered at the village of Schunga, on the Gulf of Povenets in Lake Onega. The stratum contains however more than fifty per cent of ash, and so has up to now not been utilisable for practical purposes. A couple of other coal deposits of a similar character are known in Olonets. So far as is known there is no true pure coal in Russian Carelia, neither are any fresh discoveries to be expected, as all the rocks belong to pre-cambrian formations, and in other parts of the world coal is only found in formations of much more recent date. Similarly, there can be no question of rock-oil or naphtha.

(6) *Barite* has been found in the calcareous rocks in the island of Oleni in Lake Onega, and during recent years has been worked to no small extent.

(7) *Strontium*. A Russian geologist has discovered a peculiar strontium-containing calcium carbonate mineral in the carbonaceous schist of the Sunku district. It is unknown whether the find has any practical value.

(8) *Mica*. A number of pegmatite veins which contain light mica in large, unbroken flakes have been discovered in the gneis foundation in the province of Kem. These deposits were worked in the eighteenth century, and during recent years the working has been resumed in a number of places.

(9) *Fluor-spar*. Veins of fluor-spar occur especially in the Kandalaks area and have also begun to be worked. They are of slight importance.

(10) *Pot-stone*. There are deposits of pot-stone in the regions of Maanselkä

and Listjapohja, as well as in the villages of Torasjärvi and Koikari in the province of Povenets. From all these stone is taken for household purposes, ovens and so on. These deposits seem to have no greater importance.

(11) *Asbestos*. Thin veins of actinolite asbestos are found in the greenstone in many parts of Olonets. No technically utilisable deposits are known.

(12) *Dolomite* is common all over the Jatulian territory of Olonets. The large dolomite and marble quarries of Valkianmäge are at Tiudie, on the northern end of Sandalanjärvi, and from these great quantities of stone have been quarried as building material, for example for the Church of St. Isaac and the Marble Palace in Petersburg. Dolomite for iron works has also been quarried on some of the islands in Seesjärvi. There are unlimited quantities of this stone, especially in the region round the Gulf of Povenets, for example at the village of Pjalma.

(13) *Sandstone*. The red sandstone of southern Petrosavodsk is quarried in many places for building, and artistic industrial purposes. The largest quarries are at Shoksha. Thence came the large block of red sandstone out of which the tomb of Napoleon I. in the Invalides in Paris is hewn.

Summary. In the foregoing have been shortly enumerated the deposits of ores and other minerals up to now discovered in Russian Carelia. Some deposits of practical utility have certainly been discovered and worked. In general however, it may be said that as far as is known — and Olonets in particular has been fairly well investigated — these eastern regions of Fennoscandia are poor in mineral resources. But in regions like these, so thinly populated and so largely covered with earth strata, it can never be definitely asserted that there are no possibilities of unknown wealth.

P. ESKOLA.

6. Climate.

The climate of East Carelia is in its main features much the same as that of eastern Finland in the corresponding latitude. In the regions round the White Sea, however, it is considerably influenced by that large expanse of water. The temperature charts alone show this fairly clearly, and by watching and using the meteorological observations from East Carelia, Kola and the regions immediately to the south and east of the White Sea, we can gain a complete and homogeneous picture of the climatic conditions of Finland and Fennoscandia north of the sixtieth latitude.

We have compiled from the Russian meteorological annuals the *observations of temperature* from fifty-seven places in that part of Russia, including Kola

and East Carelia, which is covered by the appended map. From these observations, together with those obtained from Finland, and Hamberg's and Mohn's records of temperature in Sweden and Norway, Dr. O. V. JOHANSSON has been so good as to draw up the three appended isotherm charts, showing the annual mean temperature and the mean temperatures for the months of January and July. This is given as actually observed at the different points, i. e., not reduced to the level of the sea.

The annual curves show that the annual mean temperature is 0° (centigrade) in an area of northern Sweden, Finland and the Kola peninsula of which the southern limit is marked by a wavy line (the isotherm of 0°) between the sixty-fifth and sixty-sixth latitude. This line has its southernmost point in Sweden, bends north-westwards towards the Norwegian frontier, which it then follows to the north-east, runs then eastwards through Norwegian Finmark, passes between Vardö and Vadsö, south of the Rybatchi Peninsula on Kola, and then follows the Murman Coast for some distance. It then runs out into the Arctic Ocean towards the north-east, crosses the Gulf Stream in a northerly direction, and then turns back first westwards and then to the south-west, towards the southernmost point of Greenland. The southern branch of this isotherm crosses the White Sea, and after touching the Russian mainland north of Archangel bends to the south-east, and continues in this direction down to Tobolsk and Omsk in Siberia, in the fifty-fifth latitude.

Within this cold area of Fennoscandia there are two regions where the mean temperature is less than -2° ⁽¹⁾ namely, one in the middle of the Kola Peninsula, and a larger one to the west, running from the fell region of northernmost Sweden to Utsjoki in northernmost Finland. To the north of this whole cold belt, the temperature rises again towards the coast and the ocean, to an annual mean of more than $+1^{\circ}$ at Hammerfest, $+2^{\circ}$ at the North Cape, and in the west to $+4^{\circ}$ and $+5^{\circ}$ on the west coast of Norway. There is another small cold centre with a temperature below zero in the fell region of the Härjedal. The Gulf of Bothnia on the other hand considerably raises the air temperature in the autumn and winter, and so raises the annual mean temperature to $+5^{\circ}$ in the south and $+1^{\circ}$ in the north. In south and middle Finland therefore, the temperature falls from west to east, as is shown by the direction of the isotherms, which run from north-west to south-east. It rises again very markedly between and around Onega and the White Sea, to fall once more suddenly towards the east. The $+5^{\circ}$ isotherm runs through the most south-

(1) All temperatures are reckoned according to the Centigrade scale.

westerly point of Finland, past Åland and Hangö, and then goes to the south-east somewhat to the east of Reval and Pernau.

The *January isotherms* show severe minimal temperatures of less than -15° in the same areas as furnish the annual minima, namely the centre of the Kola Peninsula, and the region round Muonio in the north-western corner of Finland. The cold belt across the north of Fennoscandia is now closed, with a temperature of less than -13° and north of this the temperature rises again suddenly and markedly to -4° at the North Cape, the same temperature as is found in our Finnish south-western archipelago and at Hangö, and to $\pm 0^{\circ}$ and $+1^{\circ}$ off the north-west coast of Norway, — the same temperature as is found in Denmark, and in Wurtemberg in the same month.

The warming influence in the winter of the sea and large water areas is thus seen very clearly. In addition to the very marked rise of temperature on the northern and arctic coasts already mentioned, we see that the northernmost part of the Gulf of Bothnia has the same temperature as Petrograd and Novgorod, and that the well marked maximum temperature in the White Sea, above -10° , is somewhat higher than the temperature of Jaroslav, which our chart shows between -10° and -11° , and the same as the temperature of Moscow. Lakes Ladoga and Onega also exert a clearly perceptible warming influence. With regard to Finland and East Carelia, we find that the winter temperature falls eastwards from the Gulf of Bothnia, but exceptions are formed by the rise of temperature over and round the White Sea, and by the modifying influence of the Gulf of Finland and Lakes Ladoga and Onega. If we follow the variations of temperature from south to north, we find that in Finland the temperature varies between -2° off Åland to -15° in the fells of north-west Lapland, or over an exceedingly wide range. The average temperature of East Carelia and Kola is perceptibly lower than that of Finland, but the variation from south to north is not so great, as the range is from -9° east of Lake Ladoga to about -15° on the high plateau of Kola.

The variations of temperature between district and district are decidedly less in the *summer* than they are in the winter. So too are the changes from day to day. In the winter, if southerly or westerly winds prevail, the thermometer may sometimes stand some degrees above zero over the whole of this country, and then suddenly sink, when the wind shifts to a northerly quarter, to -20° or -30° or even lower. In the summer on the other hand, it is rare for the mean temperature of the twenty-four hours to vary by more than five or six degrees from the normal mean temperature for the particular time of year. Yet summer shows the great variation within the twenty-four hours, and this.

variation is larger, the greater the distance from the ocean or other large water area. The nocturnal frosts in the wilds of this country are well known evidence of this. If, however, we keep to the mean temperature of the different seasons, which we have been discussing, the curves for the month of July show a great difference as compared with those of the winter, in that, as is well known, the seas and large water areas now tend to lower the temperature, as they become warm more slowly than the land. Thus we now find, to begin with, that the mainland area of northern Fennoscandia, which forms the cold belt in the winter, is now comparatively well warmed, and the temperature falls towards the north, towards the North Sea and the Arctic Ocean, which surround this peninsula from west to north east. Thus, reckoning from the south of Finland and East Carelia, the temperature on the whole falls slowly but steadily towards the north, and in Scandinavia towards the north-west. This tendency is, however, disturbed by the White Sea, the arms of the Baltic, and the high ridge of Kölen, each of which causes a more or less closed area of low temperature. Striking depressions of temperature are caused by Lake Ladoga and to a lesser extent by Lake Onega, especially in the deep basins in the north of these seas.

The depression of temperature caused by the White Sea is also very considerable. While the temperature is $+12^{\circ}$ in the interior of the Kola Peninsula, east thereof at Mesen 13.8, and at Archangel 15.2, at the outlet of the White Sea it sinks to 8° . Thus the isotherms east of the White Sea run towards the north-east, parallel to the coast line, which fact is due to and shows the great increase of temperature landwards in the summer. Similarly, the isotherms on the west coast of the White Sea run towards the north-west. This northerly inclination of the isotherms on the coasts of the White Sea is so marked, that the July temperature at some distance from the coast in East Carelia is much the same as that of Finland in the same latitudes, i. e. between the latitudes of 62 and 65 degrees, or perhaps even somewhat higher. The period of observation is, however too short, and the observations themselves are too uncertain, for the isotherms to be regarded as conclusive. If the isotherms of 12° , 13° and 14° are drawn in more detail, as shown in the chart in the Finnish edition of this work, it seems as if the July temperature in this northern part of East Carelia and the neighbouring districts of Kola Lapmark were somewhat higher than on the Finnish side of the frontier, but, as already stated, this is still somewhat uncertain. In the south again, Lake Ladoga, and also Onega, cause a fall of temperature, but marked though this is over Lake Ladoga, its effect does not seem to extend far inland, seeing that the mean tempera-

ture in Olonets, Petrosavodsk and Povenets for example, is respectively 15.9° , 15.8° and 16.0° .

A few words must now be devoted to the peculiar course of the 15° isotherm for the month of July. It starts near Rügen in the south of the Baltic, runs northwards past Ösel and Åland towards the coast of Finland between Nystad and Raumo. Thence it goes over the land along the coast up to Simo, in the north, and then turns back again towards the south and south-west, somewhat further from the coast, until it gets near Lappo. There it turns north-eastwards again through Sotkamo to East Carelia, and then, with a curve southwards for the White Sea, goes up to Archangel, and so on towards the north-east.

The fact that this 15° isotherm for July from the southern Baltic goes so far north, and a little way over the Finnish coast, is due to the land being warmed more than the sea in the summer, while the curious curve southwards towards Lappo, i. e. slight cooling of the area between Simo, Lappo and Sotkamo may partly be due to the land being here rather higher, and partly also to the mostly uncultivated marshes of this region. Thus the long and narrow loop made by this isotherm from Vasa north up to Simo and back to Lappo embraces a comparatively warmer and better cultivated area between the Gulf of Bothnia on the west and the higher region of untilled bogs and marshes just mentioned on the east. If, however, we ignore these more local conditions, and look at larger areas, we find that this isotherm shows the same mean temperature for July in the northern regions of East Carelia and round Archangel as on Åland and Ösel and further south in the Baltic. This must not, however, suggest the belief that the whole summer is equally warm in these localities. The summer and season of vegetation are much shorter in Carelia and Archangel than on Åland, so that May, June and August are about one degree, September and October three and five degrees colder at Archangel than on Åland. The mean temperature, again, of the six months from May to October is on the mainland of southern Finland about the same as on Åland, but the summer is somewhat earlier, so that May and June are about two degrees and July one degree warmer there than on Åland, while August is a little cooler, and September and October about two degrees colder.

Finally, the fact that the isotherms for the year resemble the winter ones much more than those for summer, both in direction, and in the variations of temperature from region to region and from sea to land, is due to the fact that the differences of temperature between different districts and regions are much greater in the winter than in the summer, and that the «winter» is long, so that the former have more influence than the latter on the annual mean.

The second great climatic factor, which together with the temperature, exerts a decisive influence on the vegetation and possibilities of cultivating a country, is the *rainfall*.

Unfortunately the observations of rainfall are rather incomplete and uncertain in Finland, and still more so in East Carelia. We have therefore to be content with the observations from a few particular places, and will quote here the figures of the monthly rainfall for the five places in East Carelia from which the observations for the decade 1901—10 are complete, or so nearly so that the small gaps can well be filled in, and utilisable means for the period can be obtained. These localities are the Solovets group of islands in the White Sea, Kem on the western shore of that sea, Uikujärvi and Povenets inland south of Kem, and Rukajärvi south-west of Kem and on the same latitude as Kajana, whence observations are also quoted for the sake of comparison.

With regard to the places in East Carelia, there are observations from Kem for three decades, from Solovets for two, but from the other three, only for the decade 1901—10. In order to obtain a better comparison between the different localities, we shall therefore only quote the observations for this decade. This decade also furnished the best observations for the places in which older ones exist. For the sake of comparison we also give the observations from Kajana in Finland for the same period, and these figures also correspond fairly well with those for the longer period of thirty years between 1866 and 1915, for which there are complete observations, except that, in the decade taken, the months of February, June and August show about ten millimetres greater rainfall than in the longer period. This is shown in the data from Finland given subsequently. The annual total for the decade is also more than thirty millimetres greater than that for the thirty years period. The results are as follows.

Monthly Precipitation during the years 1901—1910 at five places in East Carelia and at Kajana in Finland, shown in millimetres:

Place	Jan.	Feb.	March.	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Annual Total
Solovets	16	16	14	22	26	44	51	63	53	37	31	24	398
Kem	21	19	16	27	30	58	68	73	62	38	37	23	472
Uikujärvi	15	15	13	22	36	68	71	81	61	36	30	20	468
Povenets	24	26	21	27	36	60	64	94	67	40	37	26	522
Rukajärvi	11	12	11	22	35	64	70	84	49	28	20	13	409
Kajana	47	43	30	32	36	69	96	100	53	49	42	40	637

CHART I.

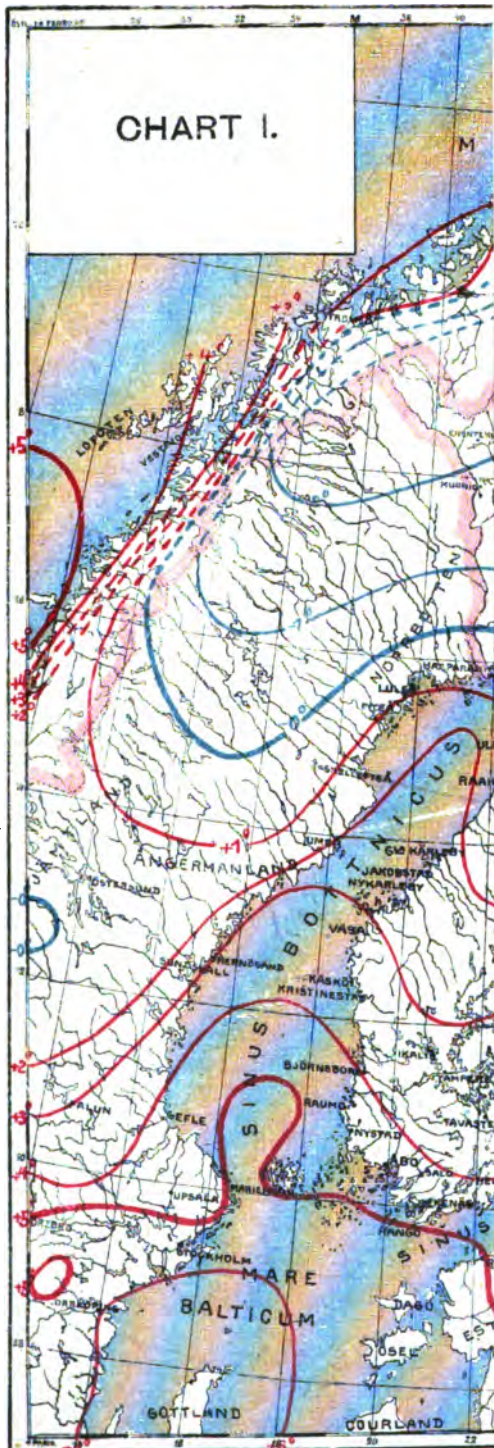
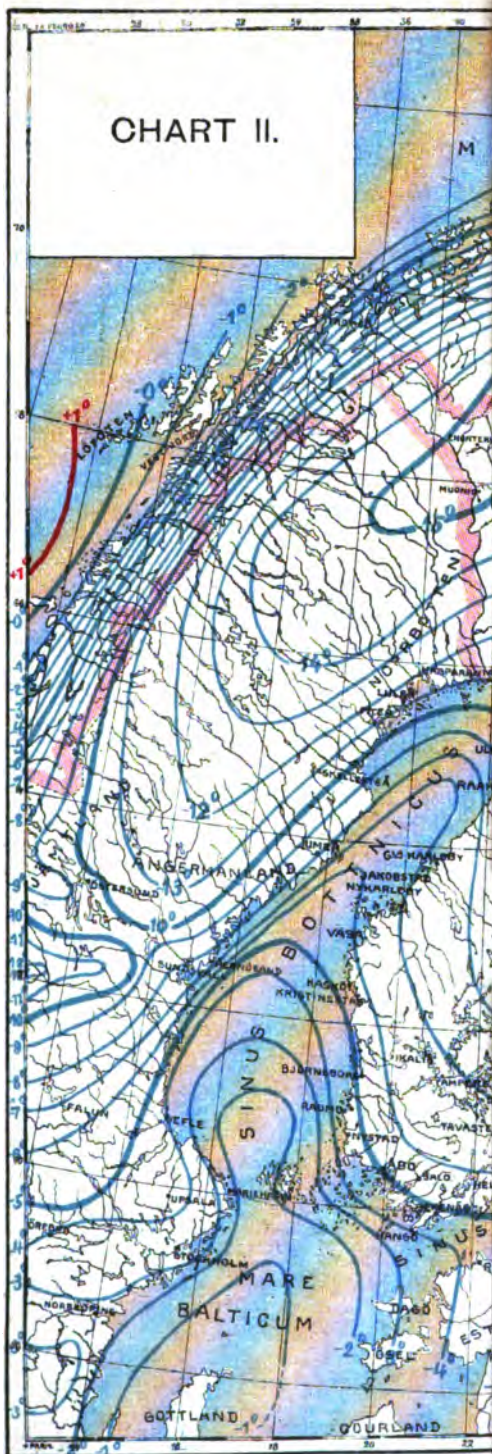




CHART II.



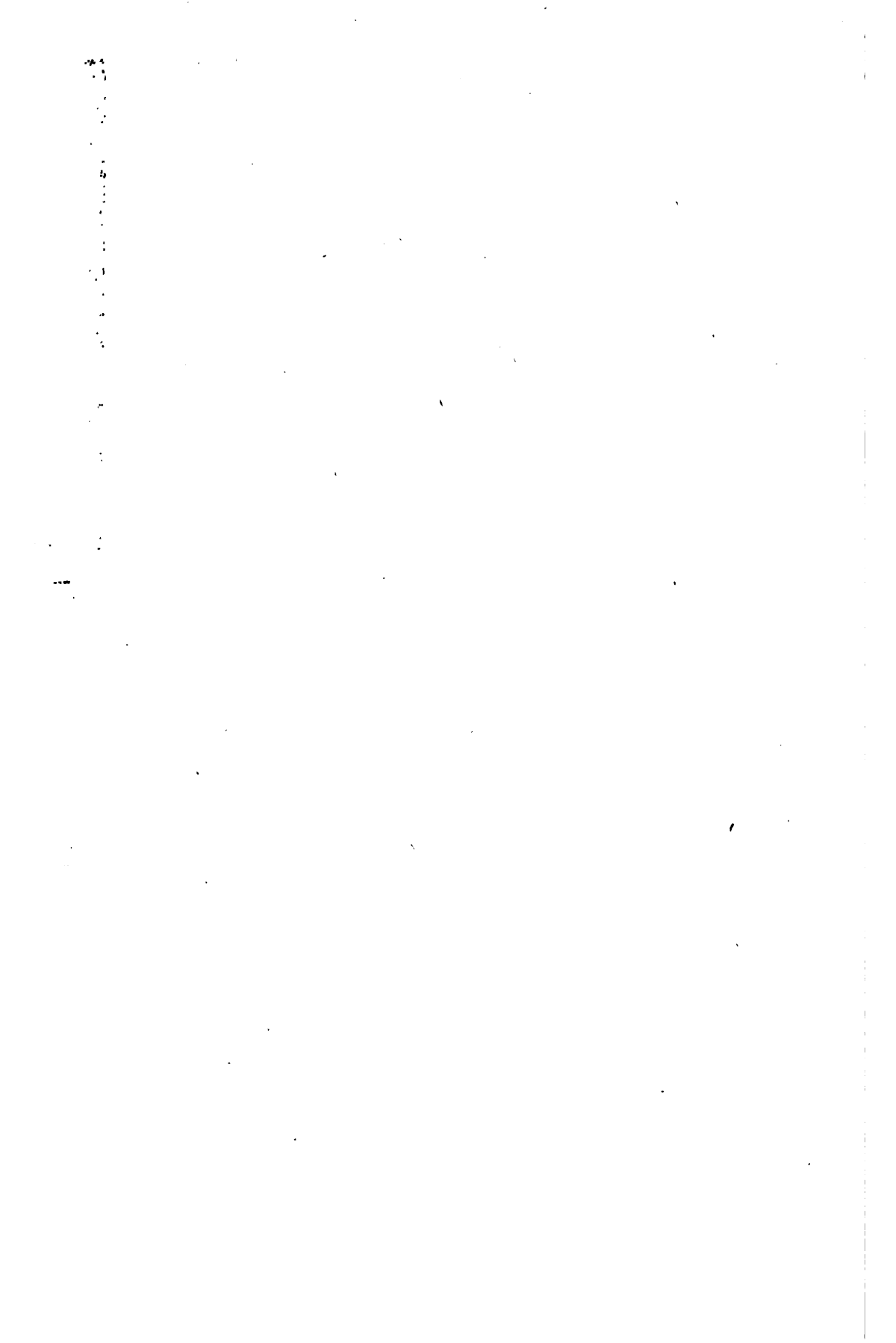
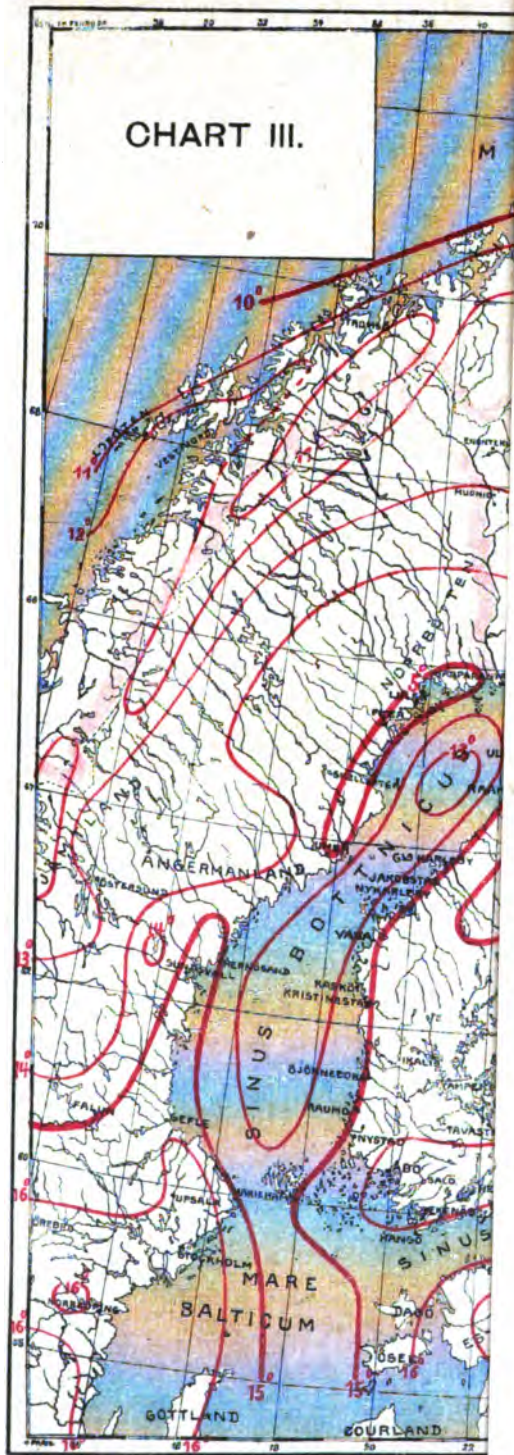
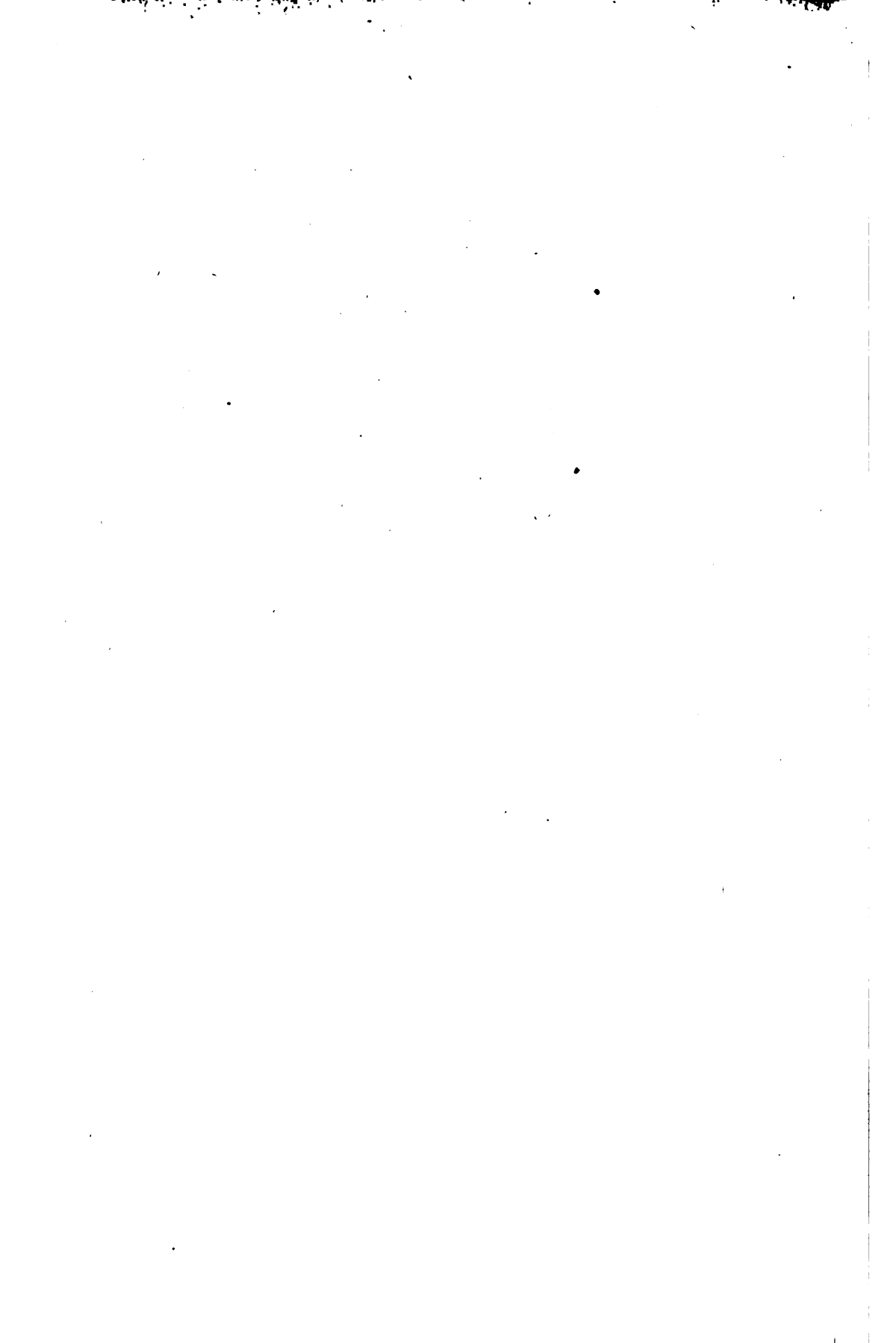


CHART III.





For calculating the average monthly rain- and snowfall it is well to have long periods of observation, for, as is well known, the monthly figures may vary a good deal from year to year. In the comparison of localities which are not too far distant from one another, however, somewhat shorter periods of observation may still be useful, provided the years of observation are the same. Another difficulty, however, is that the rain-gauges used at Solovets, Kem and Rukajärvi had not got Nipher's wind-funnel, so that the figures are certainly somewhat too small. This does not make much difference in the summer months; it has been proved at the Finnish stations that an addition of 4% to the figures of water precipitation given by the older raingauges results in the same figures as those given by Nipher's gauges. For snow, the correction has to be greater, and may be as much as 20% or more, if there is a strong wind. But even if the necessary corrections in the above figures be made for the three places in question, this does not alter the conditions shown by the said figures, in the first place, that the rainfall of East Carelia for the season *October—April* is throughout much less than in Finland. The difference is greatest for the period *January—March*, when the precipitation of East Carelia is only about half that of Kajana, or of the rest of Finland. It may be noted, however, that at Archangel and at Onega in the south-east arm of the White Sea, the precipitation for the period *October—March* is substantially greater than that for the five places in East Carelia taken here. For *October and November* it varies between 45 and 50, and for the period *December—March* between 24 and 37 millimetres. It is chiefly the low winter fall in East Carelia which makes the annual total so decidedly less than in central and southern Finland. In *September* the rainfall is about the same east and west of Maanselkä and the frontier.

In the *warmer season*, *May—August*, both East Carelia and Finland show a phenomenon which I have already demonstrated, as far as Finland is concerned, in a previous publication, — namely that the rainfall increases from the coastal regions towards the interior of the country. In East Carelia it increases away from Solovets and Kem on the White Sea, towards Uikujärvi and Povenets to the south and towards Rukajärvi and Kajana to the west. If again, Povenets and Uikujärvi be compared, there may appear to be some inconsistency with what has just been said, in the fact that in spite of Povenets' more southerly position and greater distance from the White Sea, its rainfall in *June and July* is less than that of Uikujärvi, while it is greater in all the other months except *May*, when the rainfall of the two places is the same. If further observations show this to be correct, it may be due to the influence of Lake Onega, on the northernmost arm of which Povenets is situ-

ated. This deep and extensive water area gets warm in the summer more slowly than the surrounding land, and therefore at the beginning of the summer there is very little evaporation from this lake, and often none at all. When the wind is in the south, this is bound to diminish the rainfall in the regions immediately to the north. As early as May the warming of the land, and the evaporation from the beginnings of vegetation have some effect, and this may explain why the rainfall at Uikujärvi is then equal to that of Povenets, where the vicinity of Lake Onega retards the increase of rainfall. As the temperature rises in June and July, and the vegetation develops, the rainfall in Uikujärvi becomes greater than that of Povenets, as already mentioned. On the Finnish side too, in the regions to the north of Lake Ladoga as far as Värtsilä, it seems as if this water diminished the rainfall in the beginning of the summer. — As the Russian meteorological observations were published up to and including the year 1914, I should have been glad to include the readings for the four years 1911—14, in order to obtain a rather longer period of observation, but was forced to be content with the decade 1901—10, as there are no observations from Povenets for 1911, 1912 and the greater part of 1913, while those from other places are also incomplete. It may, however, be mentioned that the year 1914 shows exactly the same relationship between the rainfall of Povenets and Uikujärvi, as the mean figures for the decade taken. The most important point is, however, that if Povenets be compared with Rukajärvi, north-west of Uikujärvi, the same conditions appear as between Povenets and Uikujärvi, as is also shown by the table. The rainfall all the year round is on the whole rather less in Rukajärvi than in Uikujärvi, and especially so in the months September—December. All the more, therefore, is it less than in Povenets, which is situated further to the south, except just in the months of June and July, where it is greater in Rukajärvi than in Povenets, although the former lies considerably further north.

With reference to *Finland*, we quote the results of thirty years' observations of the rainfall from Mariehamn, on Åland, Helsingfors and Vasa on the Gulf of Finland and the Gulf of Bothnia respectively, and Jyväskylä and Kajana in the interior of the country.

Here we see very clearly the increase of rainfall from the coast towards the interior in the summer months, especially June and July. At other times of the year, the rainfall is greater near the south coast than further inland. On Åland, however, it is unexpectedly small all the year round, and only in the late autumn, October—December, is it larger than in Jyväskylä and Kajana. Even in Vasa, further north, the influence of the sea makes it greater in October and November, and to some extent during the winter, than it is further inland.

Monthly Precipitation at Five Places in Finland in the Years 1886—1915, shown in Millimetres.

Place	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Annual Total
Mariehamn	33	31	33	29	37	35	58	74	51	60	56	49	545
Helsingfors	54	48	48	39	47	48	63	83	71	69	69	65	705
Vasa	43	35	35	35	44	49	68	73	65	60	52	43	597
Jyväskylä	41	34	34	31	41	60	69	77	62	55	47	46	597
Kajana	42	33	29	31	38	57	86	87	64	52	43	40	603

The observations from some places in Kola should be added for the sake of comparison, and in order to complete the data quoted from East Carelia and Finland. There are here practically complete observations for the decade 1901—10 from eight spots, namely three lighthouses, Sosnovets, Orlov and Sviatoinos, on the south-east, east and north-east coast of the peninsula, from Teriberka, on a little inlet somewhat to the east of the Kola Fjord, the town of Kola, Vaida-guba on the north-westernmost point of the Rybatchi Peninsula, Petchenga at the end of the Peisen Fjord, and Imandra, rather to the east of Lake Imandra. The winter observations are certainly rather uncertain in these barren, wind-swept stations, especially at the lighthouses on the coast and at Vaida-guba on the Rybatchi Peninsula, in spite of the fact that the rain-gauges at all these stations have Nipher's wind funnel. In the summer, when the winds are light, the results ought to be more reliable.

Monthly Precipitation at Eight Places on the Kola Peninsula for the Years 1901—10, shown in Millimetres.

Place	Jan.	Feb.	March	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	Annual Total
Sosnovets lighthouse	21	16	16	22	28	43	61	51	35	29	23	16	362
Orlov lighthouse	9	9	8	19	19	39	59	53	38	15	14	11	292
Sviatoinos lighthouse	33	27	22	18	22	36	56	58	43	23	27	33	401
Teriberka	26	23	22	29	32	44	58	63	54	53	41	35	485
Vaida-guba	12	11	9	13	21	33	53	33	37	34	20	19	296
Petchenga	20	24	16	18	23	38	61	47	47	33	37	30	395
Kola	17	27	16	25	32	49	77	53	47	30	40	31	444
Imandra	21	19	22	29	31	51	67	65	54	41	28	22	450

The annual rainfall is here seen to be much the same as in northernmost Finland and Finnish Lapland, and here too we see that in the summer months the rainfall increases away from the coast and towards the interior. In this respect, comparison is best made between Vaidaguba and Petchenga on the one hand, of which the former is on a cape extending into the sea, and the latter situated on a fjord, and Teriberka, Kola and Imandra on the other. Of these, the first is on a small arm of the sea, Kola at the end of a deep fjord, which stretches far into a forest region, and Imandra still further in the interior. The difference is greatest in July, when the rainfall of Kola reaches the fairly respectable figure of 77 millimetres.

The fact that the summer rainfall of Finland, East Carelia and Kola, regarded as a geographical whole, thus increases away from all the coastal regions towards the interior of the country, is due to, and in a way proves, the fact that it is the abundant evaporation from the country itself, from its vegetation and especially its forests, which then falls as rain. I have also succeeded in showing in other ways, that the greater part of the summer rainfall of Finland comes from water evaporated from the country itself, and the neighbouring lands in the east and south, and not from the surrounding sea as is the case in the autumn and winter. It is therefore very important, from the point of view of climate and rainfall during the season of vegetation, that the forests should be cared for and kept in strong growth. This is true of both Finland and Lapland, and quite equally true of East Carelia and the Kola Peninsula.

The fact again that the *winter rainfall* is so much less in East Carelia than in Finland is easily explained by the circumstance already mentioned, that the air then gets its moisture from the sea, that is to say from the seas to the south and south-west of Finland. The moist air from the sea is driven by southerly and westerly winds in over this country and on towards the east; when it meets the lake plateau, and Maanselkä further on by the frontier, it gives off most of its moisture here in Finland as rain; thus the amount of water in the air is greatly diminished, and the rainfall of East Carelia thereby decreased, and all the more as the ground here sinks towards the east. Again, it is but little moisture which the easterly and south-easterly winds of winter can bring from the Russian continent, but in the autumn when southerly and easterly winds prevail, Ladoga, Onega and the White Sea can supply moisture to East Carelia, where the ground rises towards the west and north.

The *winds* of East Carelia and Kola are during the autumn and winter, even up to April, preponderatingly southerly and westerly. From May to August on the other hand, they are mostly from the north and north-east, coming in over the land from the Arctic Ocean and the White Sea. In Fin-

**Botanico-geographical Provinces in Finland, East Karelia
and Kola Lapmark.**



- | | | | | | |
|------|---------------------------------|------|--------------------------|----|---------------------------|
| Ab | = Regio aboënsis | Ktön | = Karelia transonegensis | N | = Nylandia |
| Al | = Alandia | Ke | = Kuusamo | Oa | = Ostrobothnia australis |
| Ik | = Isthmus karelicus | Kev | = Karelia avirensis | Ob | = Ostrobothnia borealis |
| Ka | = Karelia australis | Le | = Lapponia enontekiensis | Ok | = Ostrobothnia kajanensis |
| Kb | = Karelia borealis | Li | = Lapponia inarensis | Om | = Ostrobothnia media |
| Kk | = Karelia keretina | Lim | = Lapponia imandrac | Sa | = Savonia australis |
| Kl | = Karelia Ladogensis | Lkem | = Lapponia kemensis | Sb | = Savonia borealis |
| Kol | = Karelia olonetsensis | Lmur | = Lapponia murmanica | St | = Satakunta |
| Kon | = Karelia onegensis | Kp | = Lapponia ponjensis | Ta | = Tavastia australis |
| Kpor | = Karelia pomorica occidentalis | Kti | = Lapponia tulomensis | Tb | = Tavastia borealis |
| Kpor | = Karelia pomorica orientalis | Lv | = Lapponia Varaugae | | |

land westerly and southerly winds prevail even at this season. The forests of Kola and East Carelia have therefore so much the greater climatic importance, both for those lands and for the whole of Finland, as they form a protection against the cold and therefore less moisture-laden winds from the north-east.

This short report on the climatic conditions of East Carelia may be summarised by saying that the long winter is more severe than that of corresponding latitudes in Finland, and brings less snow. The short summer on the other hand, except in the districts near the coasts, is as warm as, or perhaps even a little warmer than it is in Finland in the same latitude. The rainfall also increases from the coast towards the interior, and there approaches about the same figure as in the interior of Finland.

THEODOR HOMÉN.

7. Vegetation.

The vegetation of East Carelia so strongly recalls that of Finland that from the very beginning of botanico-geographical research in this country (WIRZÉN, W. NYLANDER) that region has been assigned to Finland from a botanical point of view, and the study of its vegetable world has ever since been regarded as a fascinating duty for Finnish students. The final proof of the botanico-geographical union of East Carelia and Finland was furnished in 1871 by J. P. NORRLIN, who described the eastern and south-eastern boundary of the Finnish natural history world as running first along the river Svir, then along lake Onega, from the northernmost arm of Onega to Uikujärvi, and then along the Uikujoki to the White Sea. He even thought that the northern portion of this boundary might be drawn still further east. This belief afterwards received still further support, and the question was decided in 1899 by the researches of A. K. CAJANDER. He held that the boundary ought to be drawn from the upper reaches of the Svir, across the south of Onega, through the more southerly area of the Vodlajoki, north of Kentjärvi and south of Ontojärvi to near the river Onega, and then run parallel to this river at a distance of ten or twenty kilometres, to the White Sea. On the other hand, Cajander thought that the Svir valley, with the western and central portions of the area to the north of that valley, ought to be separated from Finland, from a natural history point of view, and botanico-geographically assigned to Russia. The Solovets group of islands was previously assigned to the Finnish area, but more recently has been separated from it.

The whole of the territory within this boundary is more or less hilly,

has a soil and rock foundation closely resembling that of Finland, and bears a vegetation of a purely Finnish character. The forests are of the same kind, chiefly of a moorland type, there are similar, countless swamps, and on the small rocky cliffs which consist chiefly of granite or gneiss, and in the thousands of lakes and watercourses, large and small, there prevails the same vegetable community as is found in Finland. East and south-east of the above-mentioned boundary on the other hand, it is vain to seek for rocky land, and the corresponding vegetation, e. g. heaths. There we find a vegetation unknown in Finland, especially along the numerous rivers. The traveller there finds spreading meadows beside the rivers, with lush herbs and grass, luxuriant alluvial brushwood and forest, and on the river slopes grove-like copses of many different species, and everywhere plants unknown in Fennoscandia, many of which are typical of these regions.

The expert easily detects botanico-geographical differences between East Carelia and Finland, chiefly in the flowering plants. Many oriental species occur in East Carelia (i. e. species which occur on calcareous soil or in the continental climate zone), which do not extend to Finland, or have only been found in the eastern parts of this country. In places such species are even abundant, and several of them (*Polygonum bistorta*, *Lonicera Cærulea*, etc.) are widely distributed. Some species rare in Finland (such as *Rosa acicularis*) are common in East Carelia, though as a rule only locally. On the coast of the White Sea, various coastal species appear which are not found on the coast of Finland. Finally it may be mentioned in connection with the vegetation, that quagmires (open calcareous bogs) are found much more abundantly than in Finland. — In view of these differences, East Carelia and the Kola Peninsula have been distinguished as a separate eastern section of natural history Finland; the boundary follows roughly speaking the political boundary.

East Carelia is divided in our botanico-geographical literature into four different botanical provinces. These are *Olonets Carelia* (abbreviated, *Kol.*), *Onega Carelia*, (*Kon.*) *West Pomorian Carelia* (*Kpor.*) and *Kieretti Carelia* (*Kk.*); to these have recently been added the eastern provinces of *Trans-Onega Carelia* (*Kton.*) and *East Pomorian Carelia*, (*Kpor.*). (For the position and boundaries of these territories, see the appended botanico-geographical map of the Societas Pro Fauna et Flora Fennica). These territories are chiefly distinguished on floral grounds, and the following pages describe the general features of their vegetation, as far as this can be done, but the published information on the subject is for the most part meagre.

1. *Olonets Carelia* previously encompassed the whole territory from the Svir to the Suojunjoki, and is still often so reckoned. It is assigned to Norr-

lin's zone of deciduous trees, or maple zone, and owing to the good soil of many districts, and its southerly position, it includes more species than any other East Carelian botanical province. (638 phanerogams and ferns.) The species are particularly numerous on the Onega coast, the Wepsian heights north of Vosnessenje and the neighbourhood of Petrosavodsk being especially rich in rare plants. The more western part of this province is unfortunately still but little investigated, but certainly produces fewer species. It is characteristic of the vegetation of Olonets Carelia that rock and water plants form a comparatively small proportion of the whole; that in many places forest and bog plant types are found over fairly extended areas; and that owing to the comparatively numerous population, plants of cultivation (on meadows and ploughland) are fairly general. But as a result of the more numerous and older settlements, and the burn-beating that was quite recently still general, the forests are relatively worse preserved than in the rest of East Carelia, and over fairly extensive areas consist predominantly of deciduous trees. Fir and pine forests as well as mixed forests, are, however, found in several regions, and are even abundant. — In the Svir valley, and in some districts north of it, the whole landscape consists of plains or (on the middle reaches of the Svir) of Devonian hills. As already stated, this region is no longer assigned to natural history Finland, and it shows many features which are characteristic of the north Russian botanical province, such as the absence or great scarcity of rock and lake vegetation, and the presence of alluvial meadows (on the Iivinajoki) and bushy groves on the river slopes, (though these are certainly comparatively undeveloped). The region round the mouths of the Svir and part of the interior has a bald and sterile character.

2. *Onega Carelia*, lying to the north of the previous province and stretching right up to Seesjärvi, belongs to Norrlin's lime zone. The province includes two clearly distinguished parts; the *western*, to which may also conveniently be assigned the parish of Suojärvi and south-eastern Iломants in Finland, and the *eastern*. The western part is a barren region producing few species, where the moorland forests, chiefly consisting of pines, are in general very well preserved. The thinly peopled, in places almost plain-like wilderness, (Norrlin calls it the «territory of peat bogs and moors») is covered by numerous and often extensive marshes and peat bogs, among which fir-bearing bogs also abound. The fertile soil and in places favourable climate of the eastern part have made it one of the pearls of our natural history territory. The flora is nearly everywhere abundant (the number of species found in this region is 615, or more than in any botanical province of Finland on the same latitude), and there are various oriental plants of a rare kind. The vegetation



is luxuriant, especially in the south and central parts. The most luxuriant species often predominate in the forests, and beautiful groves are therefore of frequent occurrence. Here are numerous mixed forests, dominated by the pine or fir or often by the birch or aspen, which only about a decade ago were still for the most part dense, and lofty. Deciduous forest is also found to no small extent, especially on the formerly burn-beaten land belonging to the villages. The abundance of aspen in this region must be specially noted. A number of pine-bearing heaths are here found. Fertile quagmires and moist, quagmire-like meadows are very common and extensive. Bog-cultivation may in time produce here excellent cultivated land. The population is dense, especially on the coast of Onega; ploughlands and grassy fields or burn-beaten slopes add still further to the attraction of this varied landscape with its many lakes.

3. *Western Pomorian Carelia* stretches from the south of Seesjärvi to the neighbourhood of Kuittijärvi and Tuoppajärvi. It belongs to the north Finnish zone of vegetation, and is in its vegetable life fairly closely connected with the western part of the preceding province. The most characteristic features of the greater part of the landscape are thus barrenness and uniformity. Dry pine forests which abound in lichen, especially in the north, and meagre marshes and peat bogs alternate with more or less barren fir-bearing bogs. The forests are mostly well preserved, thanks to the scanty population and the absence of free rights of ownership in the land, large timber is found everywhere except in the neighbourhood of the villages, and in several places even virgin forest. Almost the sole representatives of more fertile and productive regions are the districts west and north-west of Seesjärvi, the Kellovaara region, and the region south of the middle reaches of the Kem river, which last is relatively thickly populated, and marked by its numerous and fertile quagmires. The soil on the White Sea coast is also comparatively fertile, consisting largely of clay; characteristic here are the extensive shore meadows, which at low tide are left dry in stretches several kilometres long. Several rare plants occur on this coast. On the Kemjoki and also in places on the Uikujoki, there are extensive fields of sedge, as well as leafy copses by the torrents, but generally speaking the boundless, barren swamps begin quite close to the rivers. — With regard to cultivated vegetation, it may be noted that the northern limit of oats falls within this area. It extends as far as the neighbourhood of Uhtua and Uskela, where oats are grown in a number of places, though but sparsely. It is exceedingly probable that their cultivation could be improved by the choice of suitable varieties. — The number of phanerogams and ferns known in this province is 518.

4. *Trans-Onega Carelia and Eastern Pomorian Carelia* have for the most

part never been specially investigated from the point of view of vegetation, so that our knowledge thereof is exceedingly small. The southern portion of the former province is practically the only region here which has been examined, and it forms a transition region to the calcareous Russian tract, which is fairly rich in species and in places even thickly populated. The places which have been examined in the rest of the region, and probably the whole area, are barren and monotonous, consisting of an almost uninhabited wilderness, in which the predominant features are pine or fir forest, or birch forest which has grown up after burn-beating, with extensive, open swamps. These last are calculated to cover two-thirds of the whole surface. Only along the rivers do we find more fruitful and productive tracts. On the coast of the White Sea, however, the vegetable life is more varied, and it seems to be in the main of the same kind as on the Pomorian coast.

5. *Kieretti Carelia* is the most northerly of the botanical provinces of East Carelia, and stretches from the West Pomorian province to the south-west frontier of the Kola Peninsula, in the neighbourhood of Kandalaks. Here the arctic scenery begins to be clearly noticeable. The flora consists of comparatively few species, only 406 phanerogams and ferns, and includes a number of arctic plants. The most southerly fells are in the neighbourhood of Pääjärvi; several more important heights are found further north, near the frontier of the Kola Peninsula. In the forests and swamps, which are if possible even more prevalent here than in the wildernesses further south, the north Finnish forest and peat bog species are abundantly represented. It should be noted that the forests are not only obviously well preserved, but that no small proportion of them in the northernmost parts of the province and on the coast of the White Sea, are clearly of a really strong-growing character. The fir, which is the prevailing tree in these regions, is tall and stately. The districts where the forests are luxuriant also show a very abundant flora. The region of the Oulankajoki, on the boundary of Kuusamo, and several places on the coast of the White Sea are specially noted for their rare plants. Otherwise, this province, the scanty population of which lives chiefly in the large fishing villages on the coast, has been very defectively investigated. This is especially true of the extensive central area, and the wilds in the south-east, which have not yet been visited by any botanist. — Among cultivated plants, this province produces barley, rye, potatoes and turnips. Rye is here approaching its northern limit, and its cultivation is very insignificant, especially in the northern and eastern portions of the province.

The botanico-geographical maps in the chapter on agriculture supplement the foregoing in a number of respects.

K. LINKOLA.

8. The Animal Kingdom.

The fauna of East Carelia is in essence the same as that of Finland. As extensive fells and coastal tundras only occur in the northernmost portion, the fell species characteristic of Lapland are not at home here. Yet both the lemming and the Arctic fox visit this region in their wanderings, and the birds of the fells, such as the snow bunting, shore-lark, rough-legged buzzard etc., annually fly across. The fauna of central and southern East Carelia, again, differs from that of the corresponding parts of Finland, on the one hand in the occurrence of a number of oriental species, and on the other in that the species common to both countries vary in their frequency and distribution.

There are very few species which appear in our natural history area as outposts from the east, and these only occur on its outermost edge — *Emberiza aureola*, *Muscicapa parva*, a couple of sedgewarblers and a lizard, *Lacerta agilis* — and these are not numerous, but stand so to speak on the threshold of the territory. On the other hand, other species have made themselves more at home in East Carelia, and both there and far into Finland represent the oriental element in the fauna. The most notable of these are the bittern, woodcock, nightingale, golden oriole, linnet, little gull and evening falcon. Some others have penetrated northwards in small numbers as far as Keret-Carelia, namely the flying squirrel, mink, birch-mouse, lesser shrew, and further north the smew. It may also be mentioned that during recent decades some Carelian species have clearly spread into Finland, and a considerable distance to the west, namely the German hare, polecat and rustic bunting.

Several oriental species, as well as a number of central European, have been able to spread further north in Finland than they have done in East Carelia. This is chiefly due to the fact that they have benefited by the progress of agriculture in recent centuries. Originally forests and swamps were predominant in both countries. But burn-beating and tree-cutting first opened glades, where the cattle fed, so that the glades gradually became natural meadows; then these were converted into ploughlands, which finally formed fairly continuous fields of cultivation.

Similar spots in central Europe were inhabited by a number of species which have since spread to this country. The butcher-bird, nightjar, honey buzzard, lapwing, laughing gull, a number of water birds, the mole and hedgehog probably among mammals, as well as the slow-worm and grass snake, have not yet attained any great distribution in East Carelia. Other species meet with obstacles in Onega Carelia (as also in Finland, in Maanselkä and Suomenselkä); this is the case with the wood-mouse, starling, wryneck,

jay, stock-dove, partridge, toad, and newt. Others again have already succeeded in reaching parts of the Kemjoki area, namely four warblers, (*Sylvia salicaria*, *cinerea*, *curruca* and *Phylloscopus rufus*), the robin, great tit, jackdaw, woodpecker, great curlew, woodcock, hobby, kestrel, peregrine, buzzard and sparrow-hawk. Other species again have advanced as far as Keret-Carelia, near Kandalaks; here we find the badger, water vole, bullfinch, yellowhammer, siskin, chaffinch, lark, swallow, great black wood pecker, corncrake, seamew, viper, and one species of bat. In Finland these species have spread considerably further north. Those which extend as far as Lapmark have already been named in the description of the Kola territory.

The change of scenery caused by the spread of cultivation is at the same time unfavourable and even fatal to other animals. When the virgin forest is thinned and then devastated, when forest marshes and swamps are drained, thickets cleared, and the solitude is replaced by trappers and hunters who grow ever more zealous and better equipped — then the beasts of the primeval wilderness are robbed of their haunts; they cannot stand their ground, but are forced to leave that region. In Finland various species have thus been very hard pressed, though least in the regions round Suomenselkä, and up to now this has been less the case in East Carelia.

Thus several more or less arctic animals still flourish in the south of the latter country, and are not too much embarrassed by the changes of conditions; for example the great grey shrike, Siberian jay, water-ouzel, Bohemian waxwing, pinegrosbeak, three-toed wood-pecker, golden plover and several other waders, the pintail and wigeon. The smaller beasts of prey, such as the ermine and the small weasel, are abundant, and the marten, otter, lynx and occasionally the wolf are also fairly abundant. Forest birds which have already become here in Finland so rare that they ought to be protected (the capercaillie and hazel-hen) are still so plentiful in East Carelia, that it is a regular occupation to hunt them. Water birds which flourish between Ladoga and Onega include the forest goose and the wild swan; indeed the latter is still more plentiful further to the north as there it is almost held sacred. In Finland, a few still remain in the interior of Ostrobothnia, but they are tolerably plentiful only in Lapmark.

Recently, however, the chase has become a greater danger to the native wild animals in East Carelia, at the same time as the wildernesses are being brought under cultivation. Still, however, the golden eagle is no rarity, nor in several places the mountain owl. The bear, which is much persecuted here in Finland, is also a favourite spoil of the East Carelian hunter, but is nevertheless fairly well at home, and still more plentiful in the north. The elk and

wild reindeer still wander here, though here too they, like the domestic reindeer, are the prey of the glutton and the wolf. Finally, the beaver also used to have colonies in East Carelia, but it is probably already some decades since it became extinct.

Thus, a comparison of the animal kingdoms of Finnish and Russian Carelia shows, at least as far as terrestrial animals are concerned, that the areas within which they are found, or are comparatively plentiful, are in no way bounded by the parallels of latitude, but in the case of a large number of species, cut across these very sharply. To some extent the boundaries run practically in a direction from north-west to south-east, but with many local variations. The reason is not, as in the case of the oriental species, that they are still engaged in migrating from their original homes, but that in the cultivated regions nature has been devastated, or at least so tended as to drive out a number of species.

In course of time this also leads to a danger to ourselves. In Kuolajärvi there is no longer sufficient winter pasture for the domestic reindeer. Felling is so injurious that it can scarcely be allowed, for the sake of lichen pasture, and fencing must be put up, as otherwise the reindeer make their way eastwards to Keret-Carelia. So too, the elk moves eastwards for the winter, as the snow is not so deep in those regions. The stalkers then follow its tracks. The people also cross the frontier eastwards for the sake of larger bags of ptarmigan and other forest birds, much to the detriment of the population on the other side. It is easy to see that in time to come such expeditions may give rise to conflicts, which will be more and more difficult to settle, the less opportunity the neighbours have of coming to agreement in amity. There seems already to be a certain tension with regard to the fishing, and this is likely to increase. It would be better to forestall the danger.

Finally with regard to sea mammals and birds on the coast of East Carelia, it cannot be expected that the rich fauna of the Arctic coast should be found in the remote waters which stretch in here, and are withdrawn from the climatic influence of the Gulf Stream. The fauna of the White Sea consists of fewer species. Practically the only one of the arctic whales to visit this sea is the porpoise. Among seals, the Greenland seal, bearded seal, and common seal only come as casual visitors in small numbers, but there are large numbers of gray seal and common British seal. Thus, the species which are found on our Finnish coasts are also the ones which flourish best there. Special interest attaches to the common British seal. Its home is in the White Sea, but it also lives in various fresh water lakes, such as Onega, Ladoga and Saima. It is likewise found in the Gulf of Finland, the Gulf of Bothnia and the Bal-

tic, but does not flourish on the west coast of Scandinavia. Thus the fresh-water common British seal still survives along the prehistoric channel of communication between the Arctic Ocean and the Baltic. It thus forms a memorial handed down, and ought, as a survival, to be piously preserved in the inland lakes, rather than extirpated by the offer of rewards for its destruction.

On the coast of East Carelia there are also the same kinds of birds as on the Finnish coast, but generally in larger numbers. They are not, however, so abundant as up on the Arctic coast, where food is more plentiful. Birds which breed on the Gulf of Finland and the Gulf of Bothnia include the sea eagle, osprey, oyster-catcher, turnstone, redbilled tern, eider duck, greater black-backed gull, herring gull, skua, guillemot and razorbill. In the autumn the White Sea is also visited by large numbers of birds of passage from Arctic Russia, which do not go far inland. These include the brent goose, white fronted goose, king eider, ivory gull and arctic wader, as well as a large number of long-tailed duck, and other species. When these flocks reach the White Sea, the cul-de-sac of the basin of the Arctic Ocean, they are practically forced to go further, and now have to go over land. Small flocks of them go from Kandalaks over northern East Carelia to the northern part of the Gulf of Bothnia, but most of them go in large flocks over Onega, the southern part of East Carelia, Ladoga and the Carelian Isthmus. Then in the Gulf of Finland they feel rather more at home, and still more so in the Baltic. Thus they follow the prehistoric water system already described, where nature still shows them suitable resting places.

The animal kingdom, and indeed one may say all nature, is clearly less disturbed by mankind in East Carelia than is now the case in Finland. The hoary forest king may here enjoy his winter rest in comparative tranquillity, and slake his thirst in summer with the ripe berries of the fen. Here still walk the wild reindeer and the elk, and that although the wolf has free play, while the glutton and the lynx still follow the chase. The capercaillie still plays quite at home in the primeval forest, flocks of forest geese still feed on the edge of the morass, and the swan rests calmly on her nest on the watery surface of the fen; — and all the time the king of the air, the eagle, circles above, and his vassals cruise below in search of prey.

Thus the equilibrium and peace of nature is not disturbed by the struggle between its own creatures, but by human civilisation.

Here in East Carelia the remains of our Finnish Kalevala were saved before it was too late. Here live still the remains of Finnish primeval nature, such as it grew in strength when the land arose above the waves. East Carelia

shows us Finns how our own country looked in its youth, — it may be only a few centuries ago. Here the opportunity still offers for saving specimens from threatened destruction. They can be drawn from different latitudes and different types of landscape.

Shall we know how to accept this invitation from the frontier regions of our natural-history territory? Or will its animal world and its flora suffer the same fate as the beaver, the fate which now threatens the wild reindeer in our country, and has already overtaken our primeval forests? Or shall we be sufficiently energetic to take the enlightened action of a civilised people, proclaim the inviolability of life on a large scale, and thus save large samples from the devastating effects of civilisation itself? Should we not thus indemnify our own generation against the future reproach, that in the critical moment we failed in our duty to the natural life of our fatherland?

J. A. PALMÉN.

II. THE POPULATION, ITS HISTORY, LANGUAGE AND SOCIAL CONDITIONS.

1. The History of the Carelians.

The pressure of the Slavs who pushed their way on from the Carpathians has had a very important influence on the so-called Baltic Finns, the West Finnish tribes which settled in the regions south of the Gulf of Finland in the beginning of our era. This pressure was especially fateful for the Carelians. It is evident that as early as about the fifth century of our era their forefathers had extended their settlements and hunting grounds to the neighbourhood of Lakes Ladoga and Onega, and were gradually spreading from this centre, on the one side towards the north-east, as far as the lower reaches of the mighty river Dvina and the coast of the White Sea, and on the other side towards the north-west, along the water courses that fall into Lake Ladoga, to Finnish Carelia, to Savolaks, even to Ostrobothnia, and to what was called Kvænland. Thus the magnificent solitudes with their wealth of furred animals, which had previously for the most part been owned by the Lapps, fell into the hands of the Carelians. Their natural riches caused even these distant tracts to be drawn into the sphere of the trade relations which more southern countries maintained with northern Russia, the memory of which is preserved both in the literature of the Scandinavian sagas and in old Russian

chronicles. But while trade served to raise the standard of life and increase the prosperity of the people, it also led to the ruin of the national, independent social life which had arisen among this widely scattered Carelian folk. It is easy to understand that such a fate could not be averted, when we remember that the Carelians had to defend their independence against three peoples which had reached a higher stage of civilisation than themselves.

The desire for conquest and plunder led the *Russians*, or to be more exact, led enterprising men from the commercial republic of Novgorod on the Ilmen Lake, to try to get possession of the regions of northern Russia, with their wealth of forests and waters. We do not know when they first came into direct contact with the Carelians, but it is probable that the latter had their part in the foundation of the Russian Empire, since the town of Ladoga, called in the northern legends Aldeigjoborg, which is mentioned (about 860 A. D. according to the chronicle) as Rurik's first residence, was founded in the southwest corner of the Carelian territory, or in its immediate vicinity. It is natural for geographical reasons that Ladoga Carelia, i. e. the regions between Lakes Ladoga and Onega, and the Carelian Isthmus, should be the first parts of Carelia to enter into relations with Novgorod. The nature of these relations is shown by the fact that Olonets had to pay tribute as early as 1137, though this was probably exceptional, and that in 1143 the Carelians, then first called »Korela» in the Russian records, supported the people of Novgorod in a war against some tribe of »Jäms» i. e. Tavasts. So also in 1149 they supported the Novgorodians against the princes of Suzdal, and in 1227 Prince Jaroslav Vsevolodovitch is said to have sent priests to the Carelians, »practically all» of whom received baptism. These statements must not, however, be taken as meaning that the Carelians had already lost their independence and submitted to the Novgorodians. The Ladoga Carelians are not mentioned at all in a document of 1265 which gives a list of the peoples subject to Novgorod, and as late as the year 1270 the merchants of Gothland were informed that if the Gothlanders suffered any injury on trading journeys in Carelia, the people of Novgorod »had nothing to do with it, — in other words, commands from Novgorod had not yet any effect in Carelia. Nevertheless the people of Novgorod were constantly trying to attain such command. Severe struggles between Carelians and Novgorodians occurred repeatedly (e. g. in 1278 and 1314), and in these fights it was usually the former who were defeated. Kexholm (»Karjalan linna», »the Carelians' castle», in Russian often called Koréla) was established to defend the Ladoga tract, but in the beginning of the fourteenth century this fortified place fell into the hands of Novgorod. In 1333 Ladoga-Carelia was bestowed on the son of a Lithuanian prince, Narimont. The Ca-

relians' attempt to free themselves from this dependent position did not succeed.

While the Novgorodians were trying to extend their power in Ladoga Carelia, they also tried to get a foothold in the more northerly portion of the Carelian territory. The inhabitants of these regions, living on the other side of the extensive forest area north-east of Lake Onega, are called in the Russian chronicles »the Tchuds beyond the forest belt«. The people of Novgorod wanted to reach the Carelian territory lying between the river Dvina and the coasts of the White Sea. The first journey to this Zavolotchia (»land beyond the forest belt«) mentioned in the annals, took place in 1032, but apparently this expedition did not penetrate Carelian territory, for the neighbourhood of the river Vytchegda is mentioned as the goal. A saltworks on the coast of the White Sea, which undoubtedly was on Carelian land, is mentioned in 1137 among places from which the Novgorodians levied tribute; the Carelians living there had certainly been subjected to visits from the Novgorodians by that time, and probably earlier. Zavolotchia defended itself for a considerable time, however, and clearly with stubbornness and success. Norwegian records say that the Biarmians on the Dvina had a king of their own as late as 1216. Nevertheless, an official Russian document of 1265 mentions among territory which belonged to Novgorod, Zavolotchia, Kolo-Perm and Ter, — that is to say, the Carelians' land in the north, together with the Kola and Ter territories. But in 1323, again, Novgorod undertook a military expedition to Zavolotchia, and in 1342 a Novgorodian force suffered a defeat there. These statements in Russian documents put it beyond all doubt that the taxation of the Carelians, which is so often mentioned in the records, only consisted in the exaction of military tribute, which the people was forced to pay when the exacter had a sufficiently large military force at his back. The earliest statements that the Dvina Carelians took part as allies in the military expeditions undertaken by the people of Novgorod may also be taken as referring to isolated instances. At the same time, however, a Russian governor and Russian boyars are mentioned in Archangel as early as 1327. Generally speaking, it may be taken that the authority of Novgorod was established in northern Carelian towards the second half of the fourteenth century. The Novgorodians had still to endure severe fighting in the regions of the Dvina in the years 1364—5, but the Carelians were at a disadvantage, and from about the year 1400 Zavolotchian Carelia may be regarded as subject to Novgorod. The latter state was, however, not long to enjoy in peace the fruits of victory. As early as the beginning of the thirteenth century the Rostoff Russians in Ustyuk and the Muscovites, having gradually established their power, had by peace-

ful means or by force, begun to exploit the riches in Zavolotchia. After many struggles with varying success, Moscow subdued Great Novgorod itself, and became master of the republic and its dependencies.

Seeing that Ladoga Carelia and Dvina Carelia had come under the suzerainty of Novgorod, the Carelians who had penetrated furthest up into the north were also recognised to owe tribute to the Novgorodians, for example in the frontier treaty of 1251 between Norway and Novgorod.

The Carelians were also menaced by their western neighbours, the Norwegians and Swedes as well as by the people of Novgorod.

The *Norwegians* came into contact with the Carelians both in Zavolotchia and on their own frontiers, in the northern Lapp regions. In the Scandinavian sagas the inhabitants of the former territory are called Biarmians (Beormias), a name which included, however, all the Finnish tribes in northernmost Russia, as far as they were known to Scandinavia. The name comes from the same root as the present word »perm» (Finnish perma). In the Russian chronicles the forms peremj and permj occur in old place-names, e. g. Great Permj, and Kolo-Permj. The Norwegians made expeditions to the land of the Biarmians extending over a very long period, from the end of the ninth century until about 1220. The Norwegian Ottar is mentioned in Alfred the Great's famous geography as the first who visited that country. He sailed from Halogaland in the year 874 along the coast of Kola, probably to the mouth of the Dvina, where he found inhabited and well cultivated regions. Subsequently the Norwegians made many trading expeditions thither, of which the most famous is that undertaken by Thorer Hund and his following in 1026. After the Norwegians had concluded their bargains, they broke the commercial peace they had made, and before returning home plundered the wealthy burial ground of the Biarmians, with the great treasures of the famous god Jomali. The last expedition to Biarmaland which is recorded was in 1222, and by degrees even the name of the Biarmians fell into oblivion. In the frontier treaty made between Norway and Novgorod in 1326 the Russian name »Zavolok» is used instead.

The Norwegians had also come into conflict with Carelians on their own frontier, especially in the north Finnish territories of Finmark and Kola Lapmark. The cause of these conflicts was the protracted rivalry for the mastery of the Lapps, who were weak, it is true, but possessed valuable natural resources, as well as the rather successful attempt of the Carelians to extend and establish their power among the Kvæns in northern Finland, in close proximity to Sweden and Norway. As early as the year 874 it is stated that Carelians, apparently from Ladoga Carelia, had come to trade with the Kvæns and to

plunder at the same time, This expedition, however, came to an unfortunate end, as the Norwegians came to the assistance of the «king» of the Kvæns. About 1300 the Carelians plundered Finmark, several Lapp districts and also Kvænland. A plundering expedition of 1278 ended by the Norwegian liegeman being taken prisoner by the Carelians, after thirty-five of his men had fallen. The Carelians again invaded the country in 1302 but their reception was such that they afterwards remained fairly quiet for nearly twenty years, until the year 1319. The Norwegians naturally did not fail to avenge these expeditions, so that there was an almost unbroken state of war in the frontier districts, until in 1326 a fairly binding agreement was made between Norway and Novgorod. This treaty provided that the merchants of both parties were to have the right to visit the territory of the other party without hindrance, gave both parties the right to levy tribute from their own Lapps in the area between the Malonger Fjord and the Vieljoki, and also regulated for a time the relations between the Norwegians and the Carelians. The last-named were clearly reckoned as tributaries of Novgorod.

More important to the Carelians than these struggles with Norway, was the war with *Sweden*, especially in Ladoga Carelia. Erik Vidfamne, who lived in the seventh century, is said to have made an expedition to «Gardariki» (i. e. Russia) across «Kyrjalabotn», apparently the innermost part of the Gulf of Finland. In revenge for this and similar Viking expeditions, the Finnish tribes made an attack on the Swedish mainland; one such return visit, to the Maelar district, is mentioned in 1187, when the Carelians are said to have destroyed the town of Sigtuna. The struggles were the more severe and violent, as Novgorod stood behind and usually supported the Carelians in their attacks on the Swedes, not wishing to leave room or opportunity for a new and dangerous competitor for the power in the west. The encounters here became all the more menacing when Sweden had subdued Finland Proper and Tavastland, and brought them under the influence of the Roman Catholic Church. Often, for example in 1191, 1198, 1228 and 1240, the struggle degenerated into a wild war of extermination. A Bull of Pope Alexander IV. (1256 or 1257) says that the «enemies of Christ», the Carelians, killed the Christians, burned villages and devastated fields, desecrated holy places, and carried off baptised children to be brought up in heathendom and sold as slaves. A Swedish official document gives the following account; — «The heathen Carelians have in former times committed munder, pillage and countless cruelties, without respect for sex, estate or age. They have gone so far as to cut out the heart and intestines of those who fell alive into their hands, and they have in every way mishandled sailors on the Baltic, both our own and those of other count-

ries. Therefore, out of compassion for the sufferings of these unfortunates and in order to propagate the Catholic doctrine, we have converted them to Christianity, when, by the grace of God, we had conquered them. We have also, with the help of a large army and at enormous expense, built the castle of Viborg, to the glory of God and the holy Virgin, in order to protect our land and to secure safety and peace for seafarers.» The last-named measure, the foundation of Viborg castle during the crusade of Tyrgilr Knutsson (1293), was necessary for the maintenance of peace and for the establishment of the Swedish rule in Carelia. The fortress of Landskrona was built on the Neva for the same purpose in 1299 or 1300, but was, however, soon afterwards destroyed by the Novgorodians. In spite of all their efforts, the Swedes do not seem to have succeeded in gaining much support from the Carelians. It is related that in 1314 a Carelian force which was defending Kexholm against Novgorod asked help of Viborg, but the assistance afforded by the Swedish garrison there was insufficient to save the Carelian fortress from falling into the hands of the Novgorodians.

The foundation of Swedish power at Viborg made Ladoga Carelia an apple of discord between the two states which caused centuries of struggles. The peace of Nöteborg (1323) was the first interlude in these struggles, and an important turning point in the history of the Carelians. By this peace the three districts of Savo, Jääski and Äyräpää were accorded to Sweden, while the main part of the Carelian territory, and the out-lying lands, including northern Finland, the so-called Lappish waste, was recognised as belonging to Novgorod. Thus Carelia was cleft in two, and both halves were subject to foreign powers.

The frontier fixed by the Peace of Nöteborg did not last long. As the Swedes consolidated their power in Finland they began to extend their territory, at first by peaceful methods. They encouraged the formation of new settlements, on the other side of the frontier, and propagated the Roman Catholic faith there, all with the object of removing their frontier further to the east and north-east, especially in northern Finland. This fact, together with the inborn inclination of the population for pillage, led to constant frontier feuds and plundering expeditions towards the end of the fourteenth and beginning of the fifteenth centuries. In these the aggressor was generally to be found among the Carelians on the other side of the frontier or among the Novgorodians, who were generally very ready to help them. Thus the Carelians took part in a plundering expedition to the Kajana district in 1431; in 1444—5 they invaded Norway, when the Norwegians and Swedes replied with a plundering expedition in Kem Carelia; a Carelian and Russian force made a wild onslaught

on Ostrobothnia in 1477—8, and during the «Great Russian War» of 1495—97 terrible havoc was wrought by both sides in the frontier areas from Viborg right up to Ostrobothnia. The devastation was so complete that, as the rhymed chronicle says; «Carelia, Savolaks and half Tavastland lie waste, Nobody now lives there, Neither dog, cock nor cow, Who can rest there, The land lies waste for more than eighty miles».

The fighting had taken on a more intense and violent character in the last decades of the fifteenth century, as the Grand Duke of Moscow, an aggressive and ambitious city, was now the deciding force in Russia. He had in 1478 united Novgorod to his dominion. Moreover, the Carelians on the White Sea had now an active source of agitation and a leader in the Solovets monastery on the island of Solka, which came to be of decisive importance, especially in the later conflicts. Sweden was torn by internal dissensions, which had a disastrous effect in the crippling and weakening of the defence of Finland. Matters did not improve in this respect until the house of Vasa came to the throne.

During the reign of Gustavus Vasa the frontier fighting was of slight importance. Even the official war which came to an end in 1557 left no very deep marks, although the land on both sides of the frontier was devastated. The position became more difficult when war with Russia broke out again under John III. The Swedes waged war in south-east Finland, devastated territory in Ladoga Carelia, and in 1581 even penetrated far into Olonets Carelia, up to the river Svir. Kexholm was taken in 1580, and this victory led John to regard all Olonets, Kem Carelia and the Kola Peninsula as Swedish possessions, because they were said to have belonged of old to the fiefs of Kexholm castle. The eastern frontier of Finland would thus be that given by older writers, e. g. *Bureus*, namely, the Svir, Lake Onega, Uikujärvi, the Uikujoki, the White Sea and the Arctic Ocean. On this frontier the narrow isthmus of Maanselkä forms the only connecting bridge to Russia. Many destructive «wars of pillage» flamed up between Finland and Kem Carelia, between 1570 and 1580, and again after 1590. In these *Erik Kranck*, *Juho Vesainen*, *Talvi Kauppinen* and others led guerilla bands which ravaged from the northernmost bay of the White Sea down to Suma, laying waste inhabited regions, fishing stations, salt-works, etc., both on the coast of the White Sea, and along the course of the Kemjoki. The Carelians and Russians did not fail to reply; the neighbourhood of Oulu Lake, Liminka and the Siikajoki experienced their cruelty. The guerilla warfare did not even cease after the peace of Täyssinä (1595), when Kexholm was restored to Russia, the frontier being drawn further north, over Sääminki, Nilsjä, Kuusamo and Inari to the Varanger Fjord.

The war of Charles IX. also produced important conflicts on the Carelian frontier. In 1610 there was an unsuccessful expedition to Kola, and one the next spring along the southern arm of the Kemjoki to the White Sea, the Carelians replying during the same summer by ravaging the country round Oulu lake. The desire for peace seems, however, to have been strong in Ostrobothnia, for even while the war was still in progress steps were taken for restoring peace on the frontier, which came into effect in 1614. Hostilities did not completely cease, however, until the Peace of Stolbova in 1617, when the frontier of Finland was fixed very much as it is today, on a line which follows the ridges of the Maanselkä for a long part of its extent.

The Peace of Stolbovo closed the second period of the history of the Carelian people, a period of about three centuries which had not only externally divided into two the people most nearly related to us, but also tended to sow the seeds of discord among that people, and to deepen national contrasts. During this period the brother on the western side of the political frontier had become «Swedish», and the brother on the eastern side had become «Russian». Henceforth the line between these two Carelian lands became more and more noticeable in the population. During the first century after the Peace of Stolbovo in particular, a large part of the strictly Carelian population, which was of the Greek Catholic faith, numbering several thousand souls, migrated from the regions subject to Sweden, where it was at times very difficult for the peasants to gain a livelihood and repeated attempts were made to convert the peasantry to the Lutheran faith, over to the Russian side of the frontier, even as far as the provinces of Tver and Novgorod. The remainder gradually amalgamated with the settlers who immigrated from the west, from Savolaks principally, but also from Tavastland and Ostrobothnia. Carelians proper only remain in a few inaccessible parishes of easternmost Finland, — Salmi, Suistamo, Suojärvi and Impilahti; here the language closely resembles that of the present Olonets Carelians. It was only after this migration that Carelia east of the frontier, «East Carelia» became stabilised as a unity, the social structure of which differs noticeably from that on the Finnish side.

Previously to the Peace of Stolbovo, there had also been important changes on the other Carelian frontiers. Long before, under pressure from the Russian settlements, which constantly penetrated further north, the Carelians had either withdrawn westwards from the Dvina and even from the south coast of the White Sea, or else begun to coalesce with the Russian population. The sea coast between Kem and Kandalaks, where the Carelians seem to have been settled at a comparatively early date, became russified later. The northern

frontier of the Carelians, which in the present province of Kem probably followed the Kiitehenselkä (Kivijärvi)—Kemjoki water system until the seventeenth century, began to move further northwards, as new settlers came both from the south-east and also, especially during the «Great Northern War», in considerable numbers from the Finnish side of the frontier, and penetrated the north-western territory, which had previously been occupied by the Lapps. The population of north-western Carelia, round Tuoppajärvi and Kuittijärvi is rather closely related to the frontier population of Finland.

During the following century, the history of Russian Carelia offers comparatively few external changes or events of general interest. When the frontier fighting came to an end, internal conditions also began to grow more stable; peace returned, and only the wars between the states caused certain disturbances from time to time. Administrative and social conditions underwent perceptible changes during the seventeenth, eighteenth and nineteenth centuries, and the organisation naturally aimed at levelling according to the all-Russian pattern. The unlimited rights of ownership in field and meadow previously possessed by individuals, or rather by families, had to be surrendered, and even free disposal of the forest wealth was limited, the cultivated land round the villages became the common property of the communes and each family received its plot of ground in proportion to the number of male members it included. All the rest of the land became the immediate property of the crown. It was an important and priceless benefit to Carelia that the greater part of the country escaped serfdom, when this was introduced into the rest of Russia. It is true that a couple of extensive feoffs existed on the coast of the White Sea, but these came to an end comparatively early. The Solovets monastery alone retained for a considerable period (until 1764) the right to extensive feoffs and socagers, with the consequent comprehensive administrative and judicial rights. But this allegiance made the position of the population more favourable in many ways than that of the Russian Crown peasants, which involved great dependence on the self-seeking bureaucracy. In Olonets the conditions were somewhat less happy. It is true that great estates belonging to noblemen were only to be found in the south, but the compulsory labour in the crown factories became very onerous, and even almost took the form of slavery. Peter the Great had established here an iron industry of considerable importance, and the population was forced to spend a large part of its labour power, for small wages, in providing fuel and ore. This labour-slavery became so intolerable as to lead to disturbances including an insurrection in 1771 which was drowned in blood.

The past fortunes of Russian Carelia have not been light or easy. History ordained that it should be subject to a people which, with its tradesman's nature, demanded much but could give little. It tore the Carelians away from their nearest kindred, the Finns, and caused these two brother peoples to fight each other with fire and sword. The annexation to Novgorod, the settlement by Russian colonists, the consequent economic tie and other influences, exposed the Carelians to the menace of russification and produced a national danger, the results of which can now be seen everywhere, and are most marked in the south of the province of Olonets, round Lake Onega, and on the coasts of the White Sea. The Russian influence has set its mark on dwellings, clothing and food; it appears in the spiritual life of the people and in their ways of thought. The Carelian language, however, has only died out in the most easterly areas. The mother still lulls her babe to sleep in words of the native language practically all over Carelia. The native speech still expresses the grief and melancholy of the songs for special occasions, and is heard in the tender mourning lays of the «weeper women»; but in the young people's dancing rooms the Russian «pajatus» is now everywhere heard, a Russian dancing song which has degenerated until it has lost all form and meaning. The sounds and structure of the language have been given a strongly Russian colour, not to mention the many Russian elements in the vocabulary. Northwest Carelia alone, the ever memorable treasury of the rune singers, has been better able than other districts to resist russification, as the Carelians in this region were comparatively cut off from any settled Russian population, and their national characteristics received support from Finland, on which they have hitherto been economically dependent in a very high degree.

K. F. KARJALAINEN.

2. The Conversion of the Carelians, and Their Religious Conditions.

The Carelians received their first news of Christianity from Novgorod, and according to Russian records the attempts to convert them seem to have begun fairly early. Among the regions paying tribute to the bishop of Novgorod in 1137 are mentioned certain pogosts in Olonets, i. e. parishes, congregations, which to judge from their names (Juskola, etc.) were probably Carelian. Such tribute could hardly have been levied if there had not been baptised persons among the population. It has already been mentioned that Prince *Jaroslav Vsevolodovitch* sent priests to convert the Carelians, «practically all» of whom are said to have received baptism. Such acts were of importance to the

Novgorodians, partly as an expression of their religious interest, but chiefly because the religious allegiance formed an important political bond of union between the peoples. This point of view seems to have been quite clear to the Novgorodians and to have been considered the main motive. The merchant who levied tribute, or the plundering soldier, was accompanied through the desolate forests of Carelia by the priest with cross in hand, and as the independence of Carelia diminished, so too had heathendom to give way to Christendom. But in actual fact, this conversion was for long ages merely on the surface. For centuries the new doctrine exercised little perceptible influence on the hearts and minds of the people.

The missionary journeys undertaken from time to time proved comparatively barren of results, for the missionary work confined itself to demanding baptism and participation in certain external ceremonies. Better results were attained when the numerous Greek Catholic monasteries began their labours. In spite of their remote situation, some of these have risen to the position of all-Russian sanctuaries. The monastery of Kargopol was founded on the river Onega, Murom on Lake Onega, Valamo (1329) and Konevits (1392) on islands in Lake Ladoga, the Carelian monastery of St. Nicholas (1417) on the southern mouth of the river Dvina, and so on. The most famous, and the most important to Carelia, was the *Solovets monastery*, (Fig. 31), founded in 1429 (or more probably in 1435) on islands in the White Sea. This received in feoff, both from the authorities in Novgorod and from individual boyars, extensive lands on the adjacent islands and coasts, including all the estates of the noble lady Marfa Boretskaya, granted in 1470. The monastery received its largest feoff in 1591 from Grand Duke Feodor of Moscow, who presented six parishes on the mainland, «with peasants and all useful places». It was natural that the material prosperity of the monastery and the authority it derived therefrom also helped to spread and establish the Christian views it represented among the peasantry of the region, for whom, moreover, special missionaries were sometimes appointed. It is remarkable, however, that the influence of the monasteries, and their importance among the Carelians were first shown in political matters. They became representatives of the rulers, and leaders and organisers of the defences of the country. Thus it is possible that but for the strong and stubborn resistance of the Solovets monastery, Kem Carelia and Kola would have come to belong to the Swedish sphere of power. From a religious point of view it was at first of quite insignificant importance.

There are interesting statements in the Russian records which show how slowly the new doctrine took root among the Carelians. Archbishop Makarii complains in the year 1534 that the Tchuds,

Ishors and Carelians (he is referring chiefly to Ladoga Carelia) worshipped in their sacrificial places »forests, stones, rivers, bogs, springs, mountains, hills, the sun, stars and lakes... and offered to evil spirits blood sacrifices of oxen, sheep, and all sorts of beasts and birds.» The writer also says that he has heard that they »slay their children in secret, throw into the flames the holy images of saints, and seek in every way to propitiate the devil.» »And they have an ordinary man whom they regard as their priest and call »arbui» (wizard); he performs all deceitfulness, and gives the children their names.» In consequence of this complaint the monk *Ilya* was sent in the same year to put a stop to such evil practices; he destroyed the places of worship, hewed down and burned the groves, and threw the stones (i. e. the idols) into the water. In the following year he abolished various »Tchudish» customs; he forbade the women to wear over their head and shoulders wimples of the same cloth as was used for winding sheets, or to cut their hair, and he commanded all to give up magic. If the inhabitants of Ladoga Carelia, where the new civilising influences were already entrenched, were still such heathens in the sixteenth century, it is easy to imagine what Christianity was like in more remote districts. Gradually however, almost without noticing it, the Carelians came to take the Russian religious views, adopted the Russian religious ceremonies and performed them with superstitious piety; externally they became believers. The new faith, however, often concealed beliefs inherited from their forefathers, which existed side by side with it, and found expression in many different religious ceremonies. Even today we find all over Carelia, under the surface of the apparent Christianity, various traces of the primitive ancestor worship, which the orthodox view helped to maintain. On the most varied occasions bits of cloth are offered on the graves of the departed, or before crosses erected beside the rapids, by the roadside, etc. The old blood-sacrifices to the tutelary spirits, or clear relics of them, have remained to our own days, both in the Ladoga district and round Kuittijärvi, even though the ancient, indigenous tutelary spirit has been transformed into one of the saints of the church, usually St. Elias (*Ilya*), the patron of the crops. As generally happens, Christendom, superficially adopted and still more superficially understood, has abundantly contributed to an appreciable increase of superstition; the soothsayers and wizards have grown in importance. According to the standard of the Russian church, however, the Carelians are good Christians, and it must be admitted that there is no lack of sanctimony among them.

The Carelians are noted for an inclination to sectarianism, which in pre-

vious times was still more prominent. The Old Believers — a sect which holds by some of the older ceremonies and rejects the improved official liturgy of the patriarch Nikon — are pretty numerous, especially among the older generation in northern Carelia. As representative and strong champion of this doctrine, the Solovets monastery managed to defy even the armed forces of the government until about 1670, and the same teaching was afterwards supported by the Saaris monastery (destroyed about 1850), which was founded deep in the solitudes round Tuoppijärvi, by fugitive Old-Believing monks. Several Finns have had personal experience of the determination and zeal with which the Old Believers, especially the women, refuse to allow strangers to use the same food vessels as they use themselves, protect their old-fashioned and generally small eikons, which are kept separate from the orthodox ones, declaim against tobacco smoking, and condemn believers who adhere to the official faith, and naturally still more severely those who belong to an entirely foreign creed. Another remarkable sect, called the »fugitives» or »wanderers», appeared towards the end of the last century in the north of the government of Olonets, and in its vicinity on the Archangel side. This sect only recognises the sacrament of baptism, forbids marriage, demands withdrawal from social life and a life of wandering from place to place, forbids the use of passports, »the stamps of Anti-Christ», military service and the payment of taxes. Owing to persecution, the members conceal the fact that they belong to the sect, and hide their teachers and leaders, the so-called »vitsavyöt» (»those with the belt of brushwood»), in secret rooms in the farms. The third remarkable sect is formed by the »Believers» in the Kuittijärvi district; they reckon themselves Læstadians and their doctrine was introduced from Finland by the pedlars, especially from the Torneå district. Both the last-named sects have been considered dangerous and therefore been persecuted until the last few decades.

There is no question but that the Greek Catholic church has had a certain influence on the spiritual life and religious views of the Carelians, even if it has failed fundamentally to change the way of regarding spiritual phenomena which they have inherited from their forefathers and developed on their own soil. The influence of the church has, however, been comparatively small, chiefly because the priests and other church teachers were Russians, who often knew no language but Russian, and were frequently unsuited to their calling. Another reason was that until quite recent times all religious services were performed in the Russian church language, of which the population has no knowledge. There has been no religious literature in the language of the country, except translations of the gospels and a few prayer books (the oldest from 1804 and

1 20, the newest from the beginning of the present century), which were chiefly intended for the use of the priests, and thus were almost completely valueless to the population in general. The church and its institutions have achieved more in the political and national than in the religious field. The narrow Greek Catholic doctrine in Carelia has done much to accentuate the differences between Carelians and Finns, and enlarged the gulf between these nearly related peoples. Up to now, even material advantages have not been able to level these differences. The gulf can probably only be bridged by a free nationalist educational propaganda, in so far as changed conditions in Carelia may make such work possible.

K. F. KARJALAINEN.

3. The Carelian Language.

«Carelian», in the most usual meaning of the word, now refers to the Baltic Finnish form of speech used by the Carelians in Olonets and in the Kem district of the government of Archangel. It is in form and structure nearly related to the eastern dialects of Finnish. Carelian is, however, not confined to the districts named. It is also spoken in certain parts of Ingria, and there are clear relics of it in Finland, among the Catholic inhabitants of Salmis, Suistamo, Suojärvi and Ilomants, the inconsiderable remnants of the former Carelian population of Finland. Carelians are now much more numerous in the governments of Novgorod and Tver, whither their forefathers migrated to escape war, persecution and hunger, or in search of work, and where they settled down as colonists. This population came partly from northern Olonets, from the so-called «Lapp» parishes, and partly from the regions «beyond the Swedish frontier», i. e. the parts of Carelia transferred to Finland by the peaces of Táyssinä and Stolbovo. The Carelian population of the government of Tver is fairly continuous, and the number of persons exceeds 100,000 (it was 116,750 in 1897). In the government of Novgorod the Carelians are fewer in number (9,980), and more scattered. Nationally however, the Carelian population of both these districts is weak. Completely cut off from their kindred as they are, they are inevitably doomed to coalesce with the surrounding Russians; they have already become russified to some extent, in language, and still more in outlook, even though they still vigorously maintain their position as a nation of their own, and in some places are even proud of it. The Carelians in the interior of Russia are of great interest to students, as they provide comparisons which help to form a picture of the spiritual level of the Carelians

and the condition of their language more than 300 years ago. To us Finns, there is particular interest in the fact that the Tver Carelians have no Kalevala poems, except for a few inconsiderable fragments, no richly flowing runic epic tales, no powerful magic spells or melting bridal songs, no poetry like that in which the regions of East Carelia on the Finnish frontier are so abundantly rich.

There are two main dialects of Carelian, *Carelian Proper*, spoken in the Kem Province of the Archangel Government, and in the north of the Government of Olonets, — i. e. in the greater part of the Province of Povenets —, and *Aunus Carelian*, spoken in southern Olonets, the Finnish name for which is Aunus. The differences are not great, and do not prevent mutual understanding. Where Aunus Carelian says *akku, jumalu*, Carelian proper, like pure Finnish, has *akka, jumala*; Aunus *emändi, emändän, emändäl* = Carelian *emändä, emännän, emännällä* = Finnish *emäntä, emännän, emännällä* (the hostess, of the hostess, with the hostess); Aunus *lašku, laškan* = Carelian *laiska, laizan* = Finnish *laiska, laiskan* (lazy); Aunus *pastoa* = Carelian *paisto* = Finnish *paistaa* (to fry); Aunus *kirjaine, kirjaizen, kirjastu* = Carelian *kirjane, kirjazen, kirjaista* = Finnish *kirjanen, kirjasen, kirjasta* (ornament); Aunus *lehti, lehtet* = Carelian *lehti, lehet* = Finnish *lehti, lehdet* (leaf); Aunus *suurin, suuriman* = Carelian *suurin, suurimman*, in Finnish the same (greatest, of the greatest). In Carelian Proper various shades of dialect may be distinguished, of which the most noteworthy is the difference between north (or rather north-western) Carelian (spoken roughly in the area between the Finnish frontier and a line Tuoppajärvi—Kuittijärvi—Miinaa) and South Carelian. The former is »hard» (e. g. *joki, pata, tupa, kisa pesä, šelkä, ranta, kulta, rampa*, as also in Finnish, which however has *pesä, selkä*) while the latter is »soft» (*jogi, pada, tuba, kiza, pežä, šelgä, randa, kulda, ramba*). North Carelian is much the same all over its area, but South Carelian shows very striking dialectal differences. In places there we hear, *šanuo, ažuo, aštuo, šelgä, pežä, kešteä*, in places *šanuo, ažuo, aštuo*, but *selgä, pesä, kesteä*, and in places *sanuo, azuo, astuo, selgä, pežä, kesteä*. The corresponding Finnish verbs are *sanoa, asua, astua* and *kestää*, and the nouns are *selkä, pesä* as already mentioned. A considerable area calls the mother *myamo*, in a still larger area she is *muamo*, and in the third and largest *moamo*. The differences do not impede mutual understanding.

There is rather more difference between the Finnish written language and Carelian, or rather Aunus and South Carelian, but it is not greater than the difference between the East Finnish and West Finnish spoken dialects. Finnish literature seems to offer no particular difficulties to Carelians who can read.

Carelian has been much influenced by Russian, which has caused a number of »unfinnishisms», both in the general sound of the language and in sound formation and structure, not to mention the vocabulary. A very large percentage of the words are borrowed, and some of them are still unassimilated in both sound and form. The »softness» in Southern and Aunus Carelian mentioned above (*jogi, randa*, etc.) as well as the universal liquidisation on the Russian model (e. g. *k'ivi, p'eril'i*), offend the Finnish ear, as do the many strong sibilants, the »sharp» *s*-sounds and the »thick» *l*-sounds.

Beside the words borrowed from Russian, there are also »loans by translation», i. e. Russian expressions and forms of speech reproduced in the Carelian spoken dialect. All such influences are the commoner, the nearer one approaches the Russian border, and the greater the speaker's knowledge of Russian. If it be further considered that the Carelian population is partly bilingual, and that this tends constantly to increase the accession of foreign, and to make the language poorer in native material, we can at least partially understand the train of thought of a Russian dilettante who described Carelian as a Russian dialect which had received an admixture of Finnish, — in ostensible earnest, though really in order to mislead unreasoning readers, and to get a fair excuse for the attempts to russify the Carelians.

The Russian loans in Carelian are naturally no proof of Russian origin. Carelian is a Finnish dialect, easily intelligible to a Finn, but quite incomprehensible to a Russian. The Russian contributions only denote the bridge by which the people of Carelia are crossing the national frontier and leaving the home paths in order to disappear in the mass of travellers on the broad Russian highway. It is unquestionable that the Carelians in the interior of Russia, in the governments of Tver and Novgorod, cannot escape the russification which has already reaped considerable victories in the frontier areas. But it is still quite possible for the Carelians of Kem and Olonets to maintain their nationality, yes, and still further to develop their national life, provided the pressure of Russia be removed, and the Carelians are allowed to seek support from Finland. It may be that the immediate future will show us how far external conditions are likely to be favourable to such development.

K. F. KARJALAINEN.

4. The Wepsian Language and People.

The traveller journeying up the Svir to the point where that river leaves Lake Onega, that is to the almost purely Russian village of Vosnesenie, and

thence about twenty-five kilometres to the north, will hear a peculiar language of which a Russian cannot understand a word, and which a Finn does not understand either at the first moment. Finnish ears soon get accustomed to this language, however, and soon notice that in point of fact it is very closely related to Carelian, especially to the Olonets dialects. This language is called *Wepsian*, and is spoken on a narrow strip of the coast of Lake Onega, in certain villages, viz. Himjoki (Wepsian Himjögi), Kaskeza, Kalajoki (Wepsian Kalajögi), Soutujärvi (Wepsian Šoutar, Šokš). Russian settlements and uninhabited areas separate this district from those where the Aunus Carelian dialects occur. Wepsian is also spoken in a considerably larger area to the south of the Svir, round the sources of the Ojat, and thence southwards, not only in the government of Olonets, but also in the Provinces of Tihvin and Bieloersk in the north of the government of Novgorod. Its southernmost point is about a hundred versts south of the Ojat. A third little group, consisting of villages in the volost of Isaiyeff, on the road from Vytegra to Kargopol, may here be left out of account, especially as it is possible that these villages have already become russified. The Wepsians number altogether about 25,000, of whom 7,000 live north of the Svir. These figures are, however, somewhat uncertain, owing to the deficiencies of Russian statistics. The Wepsian districts used to be larger, but a number of Wepsian villages have in course of time been russified.

The Wepsians have no certain common name. The Russians call them *Tchuds*, and further south *Tchuhars*, names which they apply to various Finnish peoples, and apparently used to employ for foreigners in general. The Finns in Olonets call their language *nakun kieli*, a name which seems to come from the Wepsian word *naku* »over there», or sometimes *Šokšun kieli*, after the most northerly Wepsian village. The name *Wepsian*, which has recently become general in scientific language (it was previously called »north Tchudish» in scientific works), is only used by the Novgorod Wepsians. Further northwards towards Olonets, there are tracts where neither the people nor even the language has a name. "He speaks this language" (Wepsian: *t'ou k'elü pagizëb*), or "he speaks like us" (Wepsian: *meid'e karitte pagizëb*), are in some places on the southern Svir the only way the Wepsians have of referring to their language. There is, however, another name generally used among the Onega Wepsians. Those who speak Wepsian are said to speak *l'üdikš*. This name is not applied to Wepsians alone, but covers Wepsians and Carelians. For if we pass from the Wepsian territory west of Lake Onega, through a few Russian villages or across uninhabited country, to the collective area of the Carelian and Olonets language, we shall find on the eastern border of that area

people whose language is just as comprehensible to Finnish ears as the Aunus Carelian, but which reveals to the student pervasive Wepsian features. These people call themselves *lüd'ikoi*. This intermediate form between Wepsian and Carelian comes to resemble true Carelian more and more from village to village, but the name does not here disappear. The same name occurs in the forms *livviköi* and *livvin kieli*, by which the people of Olonets denote their own language. This name has not, as previously supposed, anything to do with the Livonians and their language, but comes from *liüdi* (gen. *livvin*), the origin of which is uncertain (it possibly comes from the Russian люди *ljudi*, people).

It is probable that the Wepsians journeyed eastward from the common Baltic Finnish home south of the Gulf of Finland, wandering south of Lake Ladoga to their present dwelling places. After reaching the mouth of the Ojat, the Wepsians seem to have spread eastwards, mostly following the banks of that river, and making towards Bielo-ozero. The Wepsians are clearly meant by the *Ves'* people who occur in the Russian chronicles, are said to have lived in the district of Bielo-ozero, and took part in the foundation of the Russian Empire in the beginning of the ninth century. This people is not even entirely unknown in previous ages. Arabian sources of the ninth century mention the so-called *Visu* people, which lived a three months' journey from Great Bolgar and seems to have been engaged in the trade which the Bolgarians conducted along the Volga between the countries south and north-west of Europe. The name *Ves'* occurs for the last time in the year 882, after which date the term "inhabitants of Bielo-ozero" is used instead; this is no doubt a geographical description, including also Russians, who more and more migrated to these regions. With the Russians came also the Christian faith, and several religious houses were built, the first of them in the tenth century. Some time after 1238 the region round Bielo-ozero formed an independent principality, which was incorporated in the Grand Duchy of Moscow in 1385.

Wepsian is of peculiar interest to the student as it is at the same time closely connected with Carelian and also in some respects sharply contrasted with it. It is clear that in primitive Finnish times, when Finnish, Carelian, Votian, Esthonian and Livonian, together with Wepsian, still formed a practically homogeneous entity, Wepsian was the connecting link between Votian, Esthonian and Livonian on the one side and Carelian on the other, or rather between the dialects which were the source and origin of the present Baltic Finnish languages. A peculiarity of Wepsian is the retention of consonants in cases where in Finnish and Carelian they have disappeared. Thus Wepsian says *jagan*, *d'agan*, where Finnish says *jaan* (I divide); *magadan* where Finnish says *makaan* (I sleep); Wepsian *punoda* = Finnish *punoa* (to plait), and this peculiarity is

found in the transition dialects of the eastern frontier of Carelia. Noteworthy also is the disappearance of vowels in terminations and in the body of words, as in Esthonian and as in the West Finnish dialects of Finland; *must* = Finnish *musta* (black); *jumal* or *d'umal* = Finnish *jumala* (god); *kukrod* = Finnish *kykkarot* (pouches). These peculiarities often make it difficult for a Finn to grasp the Wepsian words, although the words are exactly the same, e. g. *uþtan* = Finnish *uppoan* (I drown), *l'ähtked* = Finnish *lähteet* (spring) etc. It is characteristic of Wepsian that while retaining its primitive Finnish structure, the sound formation has been very largely influenced by Russian. The phonetics of the language are entirely Russian.

The similarity of the vocabulary makes it very easy for the Wepsians to learn Finnish. I have met people among them who had been to Finland and talked Finnish quite fluently. They had learned it in a few weeks. The Wepsians are accustomed to travelling all round the world in order to earn their bread. Agriculture at home is not sufficiently productive, and it is therefore left in some places to the care of women and children. Agriculture has been made unproductive by the harassing conditions of land ownership, which are partly due to the institution of the mir (village community), and partly to the previous serfdom. Fishing pays the Onega Wepsians better, for Lake Onega can offer the finer sorts of fish, salmon and vendace. However, the Wepsians prefer roaming about. The Onega Wepsians seek work as stone masons and paviours — many of them have worked as such in Helsingfors and other Finnish towns — the inhabitants of the village of Šokš are glasiers, the south Wepsians seek work in the winter in carting timber. It may be added that the Novgorod Wepsians' mode of life is exceedingly primitive; there is not a single churn in their whole territory, but butter is made with a whisk (*härkin*), there is not a spinning wheel, but thread is spun with the spindle, the boat is a punt hollowed out of a single log and rowed by a single oar, the oven is used for bathing, and so on. It is remarkable that all this primitiveness, which is of such great interest to the ethnographer, is to be found so near Petrograd as in the Tichvin district of the Government of Novgorod.

The people linguistically most closely allied to the Wepsians are the Carelians, whose language they learn to understand completely in a few days. If communications should be improved in Wepsian territory by a more efficient government, agrarian reforms be carried out, and the level of education raised, the Wepsians could develop from their present depressed condition into useful champions in the service of civilisation. There is among them a prevailing desire to learn, and a hope for better conditions of life.

5. Statistics of Population.

The last general census in Russia was made in the year 1910, but the details thereby obtained as to the numbers of inhabitants in the different communes and as to the various nationalities, have not been available in accessible documents. We are therefore forced to be content with the statistics of the general census of 1897, and partly with special figures which are less complete, from the statistics of the governments for the years 1902, 1905, 1907, 1908 and 1910.

According to the census of 1897, there were then the following numbers of inhabitants in the different Provinces:

Province	Urban inhabitants		Rural inhabitants		Total inhabitants
Ölonets	1,246	31%	38,744	96.9%	39,990
Petrosavodsk	12,522	15.8%	67,190	84.2%	79,712
Povenets	1,294	4.9%	25,087	95.0%	26,381
Kem	2,447	6.9%	32,945	93.1%	35,392
Whole area	17,509	9.8%	163,966	90.4%	181,475

The percentage of urban population is considerably lower than the average of the other governments of European Russia (13⁰/₁₀₀). The proportion is on the average the same as in the province of Uleåborg in Finland. 96.5⁰/₁₀₀ of the rural population belongs to the peasant class.

The density of population in the various provinces was in 1897 as follows:

Province	Area, excluding water	Inhabitants
Ölonets	9,523 sq. km.	4.2 per sq. km.
Petrosavodsk	15,462 » »	5.2 » » »
Povenets	40,880 » »	0.6 » » »
Kem	nearly 62,500 » »	0.6 » » »
Whole area	128,365 sq. km.	1.4 per sq. km.

The statistics of 1897 also grouped the population according to their native language. The following are the official figures.

Language in the year 1897.

Province	Russians		Related to the Finns								Other nationalities		Total No. of persons
			Finns		Carelians		Wepsians		Total				
	No. of persons	%	No. of persons	%	No. of persons	%	No. of persons	%	No. of persons	%	No. of persons	%	
Olonets.....	10,794	27.0	581	1.5	28,532	71.3	13	—	29,126	72.8	70	0.2	39,990
Petrosavodsk	53,516	67.1	837	1.0	17,643	22.1	7,271	9.2	25,751	32.3	445	0.6	79,712
Povenets....	13,036	49.4	190	0.7	13,106	49.7	5	—	13,301	50.4	44	0.2	26,381
Kem.....	15,926	44.9	161	0.5	19,236	54.4	9	—	19,406	54.9	60	0.2	35,392
Whole area	93,272	51.4	1,769	1.0	78,517	43.1	7,298	4.0	87,584	48.3	619	0.3	181,475

These official figures give the proportion of the inhabitants speaking Finnish, Carelian dialects, Wepsian and other Finnish languages as 72.8 % in Olonets, 32.3 % in Petrosavodsk, 50.4 % in Povenets and 54.9 % in the Province of Kem. We have however expressly stated that this linguistic division does not show the real distribution of nationalities in East Carelia. It can safely be asserted that a considerable number of those entered as Russians are really Carelians who know more or less Russian and have for this reason been put down as Russian, or they may themselves, for convenience or other reasons, have reported themselves to the authorities as belonging to that nationality. The Zemstvo of the government of Olonets specially remarks in a report, that the official grouping of the population according to language made in 1897 "does not mean that the proportions given to the different nationalities were correct". The unreliability of the figures is also shown by the fact that the figures of 1907 quoted below state that out of 42,242 persons in the province of Kem, 28,022 (66.3 %) were Carelians. This is a considerably higher proportion than that given in the statistics of 1897, according to which the Carelians only formed 54.9 % of the population of the province.

According to the statistics of the governments for the years 1907 and 1908 (the Olonets, Petrosavodsk and Povenets figures are for 1908 and the Kem figures for 1907), the whole population of East Carelia was as follows:

Province	Urban inhabitants		Rural inhabitants		Total inhabitants
Olonets.....	2,137	4.6 %	43,626	95.4 %	45,763
Petrosavodsk.....	15,041	15.7 %	80,826	84.3 %	95,867
Povenets.....	1,563	4.7 %	31,548	95.3 %	33,111
Kem.....	2,870	6.8 %	39,372	93.2 %	42,242
Whole area.....	21,611	9.9 %	195,372	90.1 %	216,983

It is stated that 47.5 % of the population were males and 52.5 % females. Figures of the nationalities have only been available for the province of Kem, and these have been given above.

The population has thus grown between the years 1897 and 1908 (1907) by 35,508 persons or 19.6 %.

The density of population in the various provinces was in 1908 (1907) as follows:

Province	Area, excluding water	Inhabitants
Olonets	9,553 sq. km.	4.8 per sq. km.
Petrosavodsk	15,462 » »	6.2 » » »
Povenets	40,880 » »	0.8 » » »
Kem	about 62,500 » »	0.7 » » »
Whole area	128,365 sq. km.	1.7 per sq. km.

It may be mentioned for the sake of comparison, that the density of population in Finland in the year 1908 was 9.0 inhabitants per square kilometre for the whole country, and in the different provinces was as follows:

Province of Nyland	31.9
» » Åbo and Björneborg	21.9
» » Tavastehus	19.1
» » Viborg	15.8
» » St. Michel	11.8
» » Kuopio	9.1
» » Vasa	13.0
» » Uleåborg	2.0

East Carelia can therefore be most closely compared with the province of Uleåborg, with regard to density of population. The comparatively high figures for the provinces of Olonets and Petrosavodsk raise the average, but even these provinces do not reach the figure for the province of Kuopio, which after Uleåborg is the most thinly populated province in Finland. The figures for the provinces of Povenets and Kem show a remarkably low density of population.

The following figures as to the distribution of the population within the various provinces have been compiled from special Russian sources for the years 1902—08. Information as to the nationality of the population (Carelian, Wepsian and Russian) has been added as far as possible.

Government of Olonets; Province of Olonets.

Town of Olonets	1908	2,137	including about 500 Russians.
Tulemajärvi Commune	1905	3,258	Carelians.
Vieljärvi »	1902	5,344	»
Videle »	1905	5,694	»
Keskotjärvi »	1902	3,466	»
Kotkatjärvi »			
Riipuskala »	1902	6,316	»
Njekkula »	1902	7,312	mostly Carelians, a small proportion Russians.
Vaasheni »	1902	6,109	half Wepsians half Russians.
Mätysova »	1905	5,334	mostly Russians.

Government of Olonets; Province of Petrosavodsk.

Town of Petrosavodsk	1908	15,041	mostly Russians, a small proportion Carelians.
Munjärvi Commune	1905	6,342	Carelians, partly Wepsians.
Kontupohja »	1902	8,349	Russians, partly Carelians.
Suurlahti »	»	11,228	Russians.
Tepenitsa »			
Tulvoja »	»	12,026	»
Säämäjärvi »	»	7,457	Carelians.
Suoju »	»	7,807	Russians, a small proportion Carelians.
Jalguba »			
Pyhäjärvi »	»	3,682	Carelians, partly Wepsians.
Iadva »	»	6,249	Russians, partly Wepsians.
Soutjärvi »	»	9,589	Wepsians.
Ostretchini »	»	3,409	Russians.

Government of Olonets; Province of Povenets.

Town of Povenets	1908	1,563	mostly Russians.
Rukajärvi Commune	1905	2,229	Carelians.

Repola	Commune	1905	2,116	Carelians
Paadene	»	»	4 084	»
Petrovsko-Jam	»	1902	2,716	Russians.
Porajärvi	»	1905	2,333	Carelians.
Lindajärvi	»			
Mäntyselka	»	»	4,087	»
Danilova	»	1902	1,869	Russians.
Sungu	»	»	7,537	mostly Russians.
Rimskaya	»	»	940	Russians.

Government of Archangel; Province of Kem.

Town of Kem	1907	2,870	incl.	364 Carel.	2,506 Russ.
Market town of Suma	»	1,427	»	219	» 1,208
Kandalaks Commune	»	586	»	124	» 465
Kouta	»	737	»	94	» 619
Kieretti	»	1,089	»	548	» 541
Oulanga	»	1,906	»	1,096	» —
Kiestinki	»	3,586	»	3,586	» —
Vitsataipale	»	912	»	912	» —
Pistojärvi	»	1,318	»	1,318	» —
Vuokkiniemi	»	3,525	»	3,525	» —
Uhtua	»	3,005	»	3,005	» —
Paanajärvi	»	1,066	»	1,066	» —
Ponkama	»	1,892	»	326	» 1,566
Usmana	»	555	»	555	» —
Kontokki	»	1,872	»	1,872	» —
Jyskyjärvi	»	1,734	»	1,734	» —
Tungut	»	2,286	»	2,286	» —
Voijärvi	»	1,052	»	1,052	» —
Suiku	»	1,844	»	1,844	» —
Suikujärvi	»	1,075	»	1,075	» —
Sorokka	»	3,406	»	614	» 2,792
Lapina	»	1,471	»	—	» 1,471
Koleshma	»	1,034	»	—	» 1,034
Njuhtcha	»	2,018	»	—	» 2,018

The foregoing statistics of the population according to communes are graphically shown on the appended map, where the figures in the circles by the chief village of each commune denote the number of inhabitants in the respective communes. A table of the population of Kola according to the statistics at our disposal is here added. The inhabitants numbered in the year 1910 11,976 persons, distributed over the different communes as follow:

Town of Kola	1,000 inhabitants.
Town of Alexandrovsk	600 »
Commune of Murman Settlers (chief village Uura)	3,020 »
Kola Lapp Commune (chief village Lovozersk)	2,164 »
Ponoi Commune	524 »
Tetrina »	1,390 »
Kuzomen »	2,397 »
Umba »	881 »
<hr/>	
Total 11,976 inhabitants.	

The linguistic boundary from the Svir to the frontier of Kola Lapmark has been marked on the map by a red dotted line, from information supplied by Mr. LAURI HANNIKAINEN and Dr. P. ESKOLA, and in accordance with the preceding communal statistics of population. West of this boundary line Carelian (with Wepsian) is the main language; east of it Russian. The boundary starts from the southern frontier of the province of Olonets on the shores of Lake Ladoga, runs towards the north-east through the church-village of Vaasheni, north of Ladva church, there takes a sharp bend to the south-east, and touches the shore of Lake Onega south of the village of Himjoki. It follows that shore northwards to the village of Pedajaselkä, whence it makes a bend to the west round the town of Petrosavodsk and its neighbourhood, approaches the village of Suoju, and then follows the Murman railway north as far as Kem. The country is Carelian in the west and north, except for the coastal districts round the villages of Kalkalahti, Gridinko, Kieretti, Kouta, Knäjsa, Hetesova and Kandalaks.

ONNI LÖNNROTH.

6. The Life of the People.

Carelia, and especially East Carelia, has won fame as the land of poetry and music. The ancient national instrument, the Kantele, has been preserved

to the present day, and the ancient race of bards has not yet entirely died out.

These are the facts which make the Finnish heart beat fast when the name of Carelia is mentioned. The land is wrapped in poetry, which is fed by the lively and playful nature of the people, and its mobile fancy — qualities which are comparatively rare among the other Finnish races. The Carelians also love display and splendour, whenever their resources allow of it, and it is visible in their large and ornamented buildings, their silken clothing, their decorative embroidery, and so on.

Many a village has grown up round a large family dwelling, and the ties of kinship are still plainly evident in the number of adjacent homesteads, even when the family has dispersed. These seem to have fostered the social sense of the Carelians, and it is a fact that they are reluctant to leave their ancestral homes for the more solitary regions. They frequently visit their neighbours, and intercourse is also maintained over more extended circles. They will travel several leagues to meet relations and acquaintances, and to form new connections. One who knows Carelia writes: »the holy days in which the Greek Church is so rich are used for these expeditions. The Carelian will stay on for a working day or two if he is asked. Each village has its own festival day, »*prasniekka*«, when visitors are expected. All men and women from the home tract who then arrive are freely entertained with food and drink in the village. The advantages of having common, fixed visiting days are great. The people one wants to meet know to stay at home. Visitors do not cross each other therefore, which otherwise might easily happen, and which, owing to the great distances, would be very annoying. One also knows to be prepared beforehand for receiving visitors. And finally, it is an opportunity for boys and girls to meet, and to choose their companions for life from a wider circle. The »*prasniekka*« are also marriage markets, and this induces both young and old to attend them, the latter out of pure interest in the matter.»

Dwellers in the wilds also keep careful note of the festival days, so that none of them pass unnoticed. They carve wooden calendars, on which each day has its notch, and festivals have a special mark. In former times the trappers took similar calendars with them on their hunting expeditions.

At the festival places different kinds of games and dances are arranged. They begin with what is called a »handgame«; a girl invites a boy to be her partner, the pairs stand opposite each other in a long row, and the boy in turn takes the girl's hand and lifts it a couple of times gently, as if to see how much it weighs (Fig. 32).

Much that is ancient and poetic has been retained among the marriage customs. Female virtue is held in high honour, and lapses from it seldom occur. Many people assemble for a wedding. The wizard, «patvaska», who guards the happiness of the bridal pair, has his important allotted place. The programme includes the bride's instruction and her weeping. Others also weep at the wedding, especially the mother and female neighbours, when the bridal pair and the rest of the company have left the house (Fig. 33). The wedding ceremonies also include the bride's curtseying and bending down on the fur rug, the bath, and the veiling of the face at the wedding and on the bridal journey.

In the warm season the games are held in the open air under the open sky, or in the hayloft above the byre, but seldom in the dwelling house. The hayloft and byre are under the same roof as the dwelling house. The housewife is therefore not obliged to go out into the open air to look after the animals. The buildings are mostly in what is called the Novgorodian style, which is generally prevalent in northern Russia. The floor level is high, so that the house has the effect of a two storied building, which in fact it often is. A high, frequently roofed staircase leads from the farm-yard to the entrance lobby, on one side of which is the dwelling, and on the other the storehouse (Fig. 34). The entrance lobby also leads to the hayloft, which is a few steps higher. Under this are the byre and pigsty, and an open room in which the horses are kept, and into which they are driven by a large door or gate. Large, wealthy homesteads contain in addition to the dwelling room and store house, a room for visitors, «gornitcha», and sometimes have also a third storey, where there is an attic «sardakka», with balconies or «galdarins». Wealthy people devote much care to the external appearance of the building. The gables, eaves and window frames are ornamented. The furnishing on the other hand, is simple. The dwelling room contains benches and a table against the back wall. Beds are only found in the richer homesteads. The guest room is papered, however, and contains a sofa, a cupboard with glass doors, and window curtains. Smoke-houses have now practically entirely died out.

Much care is expended on the graves, which are called «dead-houses». A kind of shed is erected over the grave, or else it is marked by a decorative pillar (Fig. 35). The burying place is either a protected forest grove, or some island, and with its ancient trees and interesting memorials, fills the visitor with a wonderful feeling of respect and devotion. It was the old custom to leave at the burial ground the boat in which a body had been conveyed thither.

The dress has for the most part become russified, and with the eastern fashions cotton print has been introduced and come into general usage. The

older women, however, still wear an old fashioned «kosto» — a survival from heathen times. The women's dress was then made of two pieces of material which were tacked together under the arm holes, and joined on the shoulders by two clasps. Later, when these dresses disappeared, they were succeeded by ones like that in the illustration (Fig. 36) worn by the mistress at Ruva.

The mark of the unmarried women was the fillet, later represented by a folded kerchief. The married women's headdress was a hood, «sorokka», the front and neck-pieces of which were richly embroidered. A beaded cap was afterwards adopted in place of the hood.

It is long since there was any uniformity in the men's dress, which has reflected partly the Finnish and partly the Russian influence. The hunting dress, of which the most characteristic part is a wide linen coat (Fig. 37), is of ancient origin.

Until quite recent times hunting and fishing played an important part in the economic life, as is easily comprehensible in a land as rich in forests and lakes as East Carelia. The villages have their own hunting grounds, and the homesteads their own hunting tracks, along which traps used to be laid in the autumn, when the hunting season began. Such hunting tracks, on which birds and squirrels were trapped, circled at a distance of tens of kilometres round a bath house, which was built out in the wilds for the convenience of the trappers. New cross bows were still being made at the end of the eighteenth century; in the middle of that century long-bows were still in use in some places. Reindeer and bears are still to be met with in the forests.

Most of the soil is sandy or stony, or else there are large bogs, so that it is little suited to agriculture. The best agricultural land is on the river Olonets in the province of Olonets, and in the province of Petrosavodsk. In previous times a man could burn-beat wherever he liked on the land belonging to his family, but since the Russian crown assumed possession of the large and rich forests of the country and introduced a regular system of forestry, the Carelians have had to be content with the small plots of land round the villages, which were assigned to them for cultivation.

The livestock is not very numerous, the cows being of a native race which is characterized by a white stripe on the back. They milk best in the summer, when the good pastures offer abundance of fodder, but go dry towards the end of the autumn, when they are fed on rye straw. Butter making is general, either in churns, or in earthenware vessels by means of spoons. The latter method is used when the milk supply is small.

In Kem Carelia, peddling used to be one of the most important means of livelihood. Cloth was the chief article of sale. In the winter practically all

the male inhabitants of some villages in northern Carelia went over to Finland, or, as it was called, »on the Swedish expedition».

On these expeditions the pedlars learned to know Finland, and it was this knowledge of the Finnish conditions, so much better than their own, which made the Carelians begin to long for union with Finland.

The Olonets waters are very rich in ore, and its collection used to be an important source of income for a number of families. Many pass the summer by the rivers in the wilds, occupied in mussel fishing, which occasionally results in a valuable pearl. Formerly the tackle consisted of wooden tongs, but now a broom-like iron tool is used. The mussels are caught on its teeth and raked up. The man lies on a wooden raft looking down into the depths through a hole in the raft (Fig. 38). When he sees a mussel, he usually takes a small tool, but often too a larger one, throwing it then at random. If he succeeds, good; if not, he hopes to make a better shot next time.

In former times salt was obtained from the sea water at places on the White Sea Coast. The Carelians in Olonets also trained hunting falcons; and obtained high prices for them.

U. T. SIRELIUS.

7. Conditions of Health.

It is easy to realise that the care of health is still at a very primitive stage in East Carelia. No rules of hygiene have yet been preached to the inhabitants. The people live as nature taught them. The infant mortality from epidemic diseases is terribly great. There is no belief in the conveyance of infection. »God the Father knows whom He will call, whatever means man takes to preserve life», is often said. The bath-house is considered to be a remedy for all diseases, especially if it is followed by drinking vodka. It is not likely that a spirit glass conveys infection, as the spirit itself has a disinfectant effect. The Old Believers, who are otherwise very punctilious about diet, tolerate vodka for hygienic reasons, they say themselves, but consider tobacco smoking on the other hand to be sinful, »for that which goes into the mouth does not pollute, but that which comes out of it».

East Carelian families generally have a large number of children, and the mothers say quite resignedly: We shall have plenty left, if some should die. From the time children are two years old, they observe the fasts, (that is, they may not drink milk on Wednesdays and Fridays), except of course the long fast before Easter, when those who are fasting may not touch milk even on

the other days of the week. Children who survive, however, look healthy. This is no doubt partly due to the fact that their small bodies are hardened very severely. Indoors they only wear a short, coloured shirt (for reasons of cleanliness), all the year round, and all the summer they toddle about the farmyard in the same light garment. Blind people and deaf mutes are seldom seen. There are said to have been more blind in earlier times, when smoke-houses were more general. Now smoke-houses are only to be found in forest regions. Weak-sighted persons are generally employed as cattle herds.

Older persons also are ravaged by infectious diseases. Smallpox often rages in the villages, and one may hear of as many as a hundred deaths in a large village from a single smallpox epidemic. Vaccination is prescribed, but seldom takes place! That operation is dreaded and avoided when possible. The vaccinators too are neither energetic nor skilled. Vodka is considered the best remedy for smallpox, but the spirit glass is never washed, and all who want to be disinfected drink from the same glass, which both healthy and sick have used before. Tuberculosis is not specially prevalent. It is said to be commonest in the coastal villages and in the far north. Syphilis is very common among former soldiers and those who have worked as shop-assistants in Russia, but not otherwise. It is spread through the system of having a common prostitute for the »artell» (a group of workers) and when the patients do not treat themselves, its effects are obvious.

The spread of infection is very much helped by the custom of kissing the images of saints at places of pilgrimage, and by the habit of using unwashed vessels. The Old Believers avoid this last danger to some extent, as they never allow an Orthodox or a Lutheran to eat out of their vessels. If such a thing occurs, the vessel is thrown away or broken.

Bugs are not as common as in Finnish houses, as the inside walls are washed for every saint's day, and sometimes for Sundays also. The walls are made of round logs, which are smooth and so facilitate this washing. Bugs are only common in the inns. In many of these they occur in incredible numbers. One protects oneself by putting a wreath of fresh hay round the bed, which lies on the floor. Fleas are rare. On the other hand body lice occur here and there in beds and furs. It is said that Carelians seldom have lice in the beard, which are fairly common with Russians. They take great care of their beards, wash them carefully in the bath-house, and often comb them. The cockroaches may also be counted among the vermin. There are often masses of these, and they are not exterminated, as in many places they are looked upon as a home comfort. It can happen that one is forced to keep on driving these parasites away from the edge of the earthenware bowl, to be able to have the milk to oneself.

The constant hand-washings and frequent use of the bath-house make for cleanliness. The hands are washed before every meal, and sometimes after eating, in a brass bowl over a slop-pail in a corner of the living room. After a meal the mouth is wiped on a long, embroidered towel, which those sitting on each side of the table keep over their knees during the meal. Unfortunately, however, the towel is not washed every day. The bath-house is used every Saturday evening and on the eve of every saint's day. The Orthodox have many saint's days. It is not the custom for men and women to bathe together. After the bath, the nearest water course is used for cooling. Afterwards, immense quantities of hot tea are drunk, and the abundant perspiration is dried off with towels. Under-clothing also is kept fairly clean and often washed, being beaten with wooden beaters. This treatment however, makes it neither clean nor white.

The diet is simple enough, and by no means always wholesome. A long fast is followed by inordinate eating, especially of pies and pasties which have different names and various appearance. Famine sometimes occurs, especially in the spring. Every village, in the northern regions, especially those furthest from the main roads, has its pine-tree slope, whence bark is taken for mixing in the bread. Rye bread is the staple food. Fish, often dried in the oven, is also eaten, and milk as far as the supply goes.

In spite of their simple life, which is far from being always hygienic, adult Carelians are generally healthy, strongly built, straight and supple figures. They are steeled against hardship, excellent bearers, who can easily walk long distances with a burden weighing forty or fifty kilograms, and efficient if not especially persevering workers.

The *doctors* in East Carelia only number seventeen. Fourteen of these are under zemstvos, four in the province of Olonets, five in that of Petrosavodsk, and five in that of Povenets. Each of these doctors has his own *hospital*. There are also doctors appointed by the central government in the capitals of each of these three provinces. Petrosavodsk has a *provincial hospital*. There are chemists in the towns. There are four veterinary surgeons, three of them under zemstvos, and one appointed by the government (in Petrosavodsk).

J. E. ROSBERG.

8. Schools and Education in East Carelia.

In regard to intellectual nurture, the population of East Carelia, as of so many other territories, has had to manage for itself, without the guidance it



Fig. 31. Solovets Monastery.

Photo *A. O. Kihlman.*



Fig. 32. ↪Hand Game↩ (Käsikisa) Kem Carelia.

Photo *J. K. Inha.*





**Fig. 33. Women Neighbours Weeping for a
Mot-her who is Left Alone, Kem Carelia.**

Photo J. K. Inha.





Fig. 34. Lari Homestead at Luvajärvi. Province of Povenets.
Photo Vrejū Blomstedt.



Fig. 36. Woman in Old Fashioned Dress, Oulanka.
Photo U. T. Sirelius.





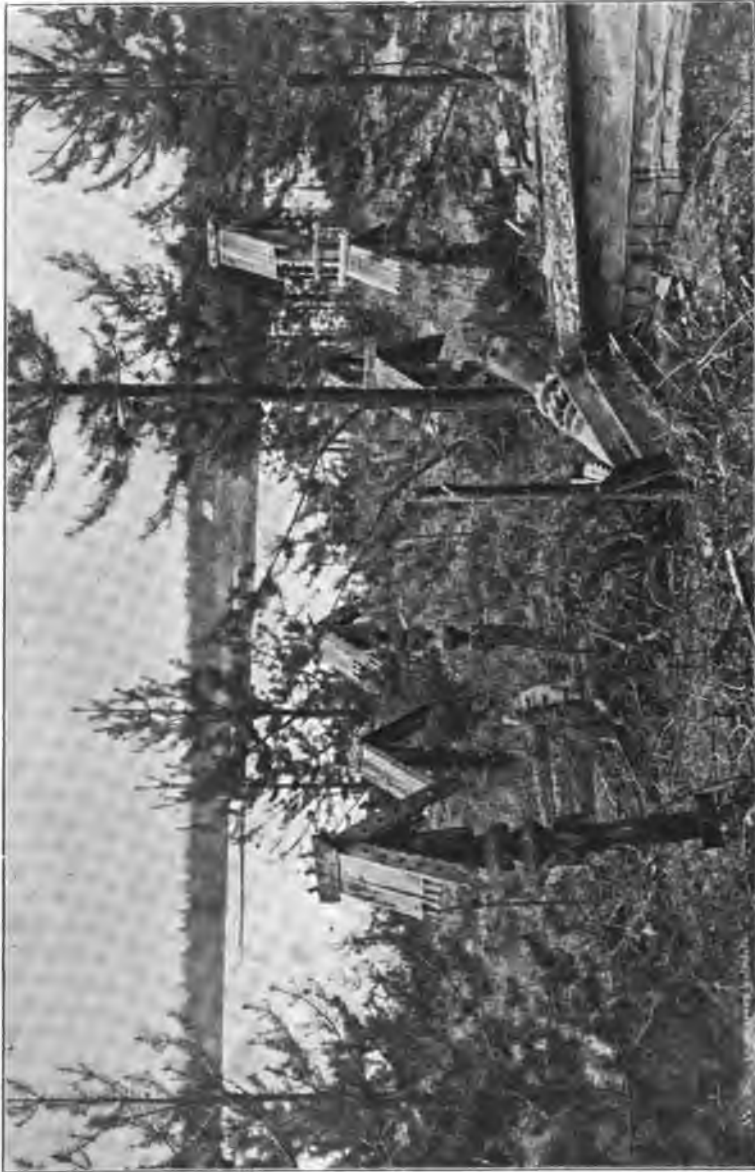


Fig. 35. Burial Ground at Luvajärvi, Province of Povenets.

Photo J. K. Inha.







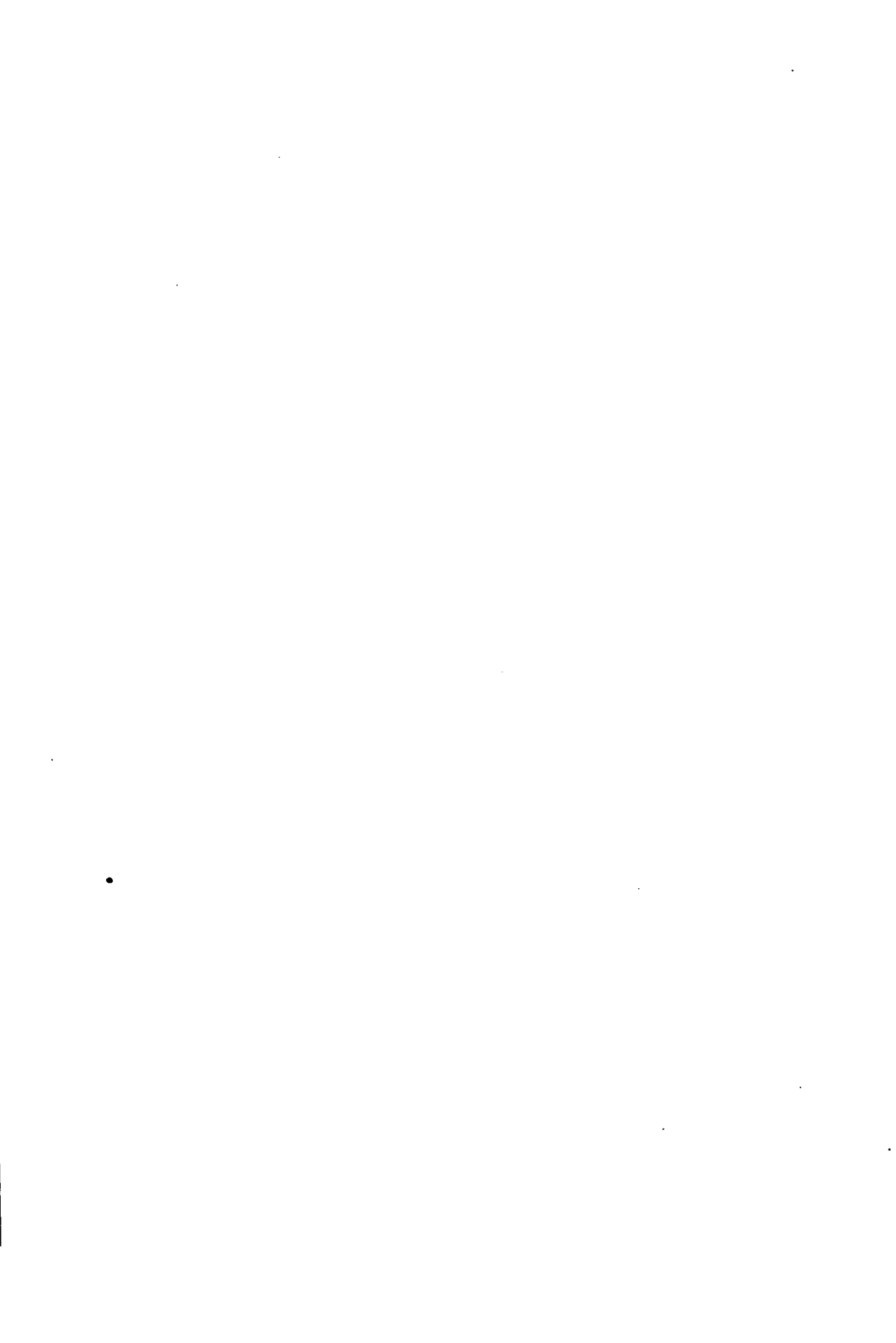
Fig. 37. Man in Old Fashioned Hunting Drees, Miinoa.
Drawing by Y. Blomstedt.





Fig. 38. Pearl Fisher, Kem Carelia. Guests returning from a party.
Photo J. K. Inka.





needed. It is true that attempts were made, as early as the eighteenth century, to establish schools in the government of Olonets, but these were of practically no service to the Carelian people. The last century brought the beginning of improvement, but the results were not perceptible to any very great extent. Until the close of the century the Russian schools worked under the constraint due to *Pobiedonostseff's* iron will, and fear of «secular» instruction among the common people. His ruling principle was that the common people only need just to be able to read, write and count, and to know the prayers and hymns necessary for divine service; all higher learning is an evil. The «secular» elementary schools with a slightly more extensive programme, established by the Ministry of Popular Instruction and the Zemstvos, were allowed to live a languishing existence, and were often located in remote villages. In the «reliable» church schools conducted by the priests, the teachers were generally ignorant priests untrained in teaching, sacristans, and women who had passed through the diocesan school, generally the daughters of priests and church servants. This educational system could not boast of the results it attained even in the central governments of Russia — the results were best in places where the zemstvos had managed to obtain a somewhat freer hand — and the conditions in the frontier districts were still worse. The literates in the province of Kem were, according to the statistics of 1897, about fifteen per cent of the population, and in the government of Olonets in 1907 they formed twenty-five per cent. Literacy was perhaps rather more general in the parts of Kem Carelia adjacent to the Finnish frontier, for the pedlars and their Finnish wives had there diffused a certain amount of interest in reading Finnish. In the last decade of the nineteenth century we made acquaintance there with an individual who had a library of some tens of works, chiefly in Finnish, and this was often spoken of in the neighbourhood as a marvel.

The twentieth century has brought great changes to the schools of East Carelia. The modest efforts of the Carelians in Finland, and their friends (especially since the year 1906) to improve the material condition of Carelia, to spread elementary education in the brotherland on our frontier, and to draw it closer to Finland by the bonds of culture, aroused in Russia a loud outcry about Greater-Finnish and Lutheran propaganda. There was much talk of the menacing danger to the union of Carelia with Russia. The infant schools and libraries with reading rooms established by funds collected in Finland were closed, and some of those who had taken a leading part in the work were imprisoned. The «Orthodox Fraternity of Carelia» was founded in 1907, with a view to maintaining the «only true faith» in East Carelia, and giving the people religious and moral instruction by the publication and distri-

bution of religious works in the popular language. The «Fraternity of Archangel Carelia» founded in 1908 «in the name of the Archangel Michael» has the same aim; the society gives as its object the establishment of church infant schools, with boarding houses; the curriculum of these schools includes handicrafts and agriculture. The secular authorities have also been given freer hands, in using which the provincial assembly of Olonets has been particularly active. In the three Carelian provinces of that Government, Olonets, Petrosavodsk and Povenets, sixty-two new schools were opened in the years 1907—9 alone, and in the Kem province of Archangel it was decided to establish fifteen village schools. Boarding houses for pupils living at a distance were opened or at least projected in connection with several of these schools. There are good grounds for the satisfaction with which a Russian writer notes that since 1907 the general principle of popular instruction has at last been realised, for there are about 350 schools there among a population of 145,000, so that each school-district contains something over 400 persons, of whom about 45 are children of school-age. This strong interest in the development of the educational system is very remarkable. The rest of Russia can hardly show its like, and it inspires both secular and religious authorities.

Unfortunately there are no exact figures as to the present number of schools. In order to give some idea of the conditions, it may be stated that the three provinces of Olonets which have a Carelian population had in the year 1912 336 village elementary schools, of which 26 were established and maintained by the Ministry of Popular Instruction, 188 by the provincial assembly, and 122 by ecclesiastical authorities. In 1907 there were 38 elementary schools in the province of Kem. There are also several secondary schools in the towns; for example Petrosavodsk has two gymnasia, a theological seminary, and elementary teachers' training school, and training schools for barber-surgeons and engineers, while Kem has, among others, a school of navigation. An institute for training missionary preachers for work among the Carelians was established in 1908 in the village of Paadene in the government of Olonets, and a training school for elementary teachers at Uhtua in the province of Kem. The town schools are naturally open to the Carelians in so far as they are able to profit by the instruction. Thus, the Petrosavodsk seminary had in 1909 four Carelians among 300 pupils.

In describing the educational conditions of East Carelia, we may mention that several merchants who originally came from Carelia and afterwards became wealthy have to some extent assisted the elementary instruction of their homeland, although this help has chiefly benefited the instruction given in the Russian language, and there have not been as many givers as might

have been expected from the resources available. The Carelian donors have obviously been thinking more of the good of their wretched souls than of the education of the rising generation; they have therefore contributed to the prosperity and splendour of the churches rather than to the schools — thus following the usual Russian example. A remarkable exception is afforded by the merchant Minin, who in 1878 gave the funds for establishing and maintaining in the village of Kiimasjärvi in Jyskyjärvi a Russian school with pupils' boarding house, which works principally at practical subjects. It can confidently be expected that as general education increases among the Carelians, they will produce men who will have at heart and hasten to support the education and instruction of youth *in their own language*. There is already a beginning in the work of »Karjalan Sivistysseura» (The Carelian Society for Popular Instruction) and its predecessor, »Vienan Karjalaisten Liitto» (The Union of East Carelians).

It would be a pleasure to dwell on this intensive educational work for the intellectual elevation of the lively and in some ways very gifted Carelian people, which is worthily supported by the work done in the government of Olonets for the advancement of economic life, were it not that the work has a sad background. The zeal is not due to unselfish interest in education, but almost entirely to the narrow spirit of russification. The intention has been to prevent the Carelians from falling into the false snares set by the Finns, and to prevent them from being influenced by Finnish culture. The chief object looming before both church and school has been to amalgamate the Carelians with the faithful Russian people »in the immediate future». This hope is by no means built on loose sand, especially as Further Carelia, even in the frontier districts, has often shown an inclination to draw away from Finland in economic matters and seek closer connections with Russia, owing to the past course of development of industry and traffic, and also as a result of the political conditions. Even some score of years ago, the present writer found in a little frontier village in the government of Olonets, that the population themselves thought it desirable and even indispensable for the rising generation to learn Russian — for Russian was needed for military service — while at the same time in the villages further east a knowledge of Russian and a Russian turn of mind were regarded as a sign of superiority and as an honour. And that was the period when the energetic, systematic and very resourceful work of russification first began. The method has changed. The commanding, resolute tone formerly used to the Carelians has become a good deal more kindly and insinuating. As late as the last decade of the nineteenth century children might not be taught their very first letters in Carelian, even if the teacher knew

that language. Later, during the first years of the present century, it at least began to be realised that it was necessary to impart the «principles of religious and moral instruction» in Carelian, and to provide the people with religious literature in their own language, to prevent the population from wishing to learn Finnish and use that tongue as the language of education. A number of the Carelians seem to have been caught on this hook baited with instruction in their mother tongue. The new winds which have blown up from Finland and even from Russia, have probably, and indeed perceptibly, injured the old leaven, and have spread among the Carelians in ever-widening circles the knowledge and conviction that there is a better future before the people of Carelia than to be absorbed into an unimportant continuation of the muddy Russian sea. They are convinced that the Carelian people has also its task in developing and maintaining its own peculiar, national cultural life.

K. F. KARJALAINEN.

9. Poetry and Music of East Carelia.

As a child I lost my mother,
 Small was I and had no mother,
 Like a lark on rocky height,
 Like a thrush in stony desert,
 Had to chirrup as a lark does,
 Had to sing the thrush's song;
 Strangers had to care for me,
 And a step-dame be my ruler.

(Kalevala, 50; 561—8).

Piennä jäin minä emosta,
 matalaina maammostani,
 jäin kuin kiuruksi kivelle,
 rastahaksi rauniolle,
 kiuruna kivertämähän,
 rastahana raikkumahan,
 vaimon vierahan varahan,
 ehtohon emintimäisen.

It is as if muse of the Finnish people had composed these lines about our kindred folk, which is severed from the common family stock. The Carelians, our unhappy brothers on the frontier, drew the worst lot. We can apply to them the dirge of the Kanteletar:

The kindred of my tribe have left me,
 As the squirrel the dry fir tree.
 The tribe has grown indignant with me,
 All my family has disowned me,
 My own brother is a stranger,
 Proudly goes my sister by me.

(Kanteletar 1, 39).

Niin mun heitti heimokunta
 kuin orava kuivan kuusen.
 Suku suuttui, heimo heitti,
 oma veikko vierastutti,
 siskoni kävi sivutse.

The fact that this was so, however, brought Finland gain. Living under hard conditions, and far from the treasures of civilisation, the Carelian race has preserved and enriched the precious heritage of our forefathers more faithfully than its kindred on this side of the frontier.

When the Finnish people woke to national consciousness, it had no ancient traditions of its past history or its heroes, but these outcast members of the Finnish race showed themselves able to give form to our most precious recollections. The seers but for whom Finland would have had no Kalevala were born and grew up in Carelia.

Scientific research, seeking to gather from the popular consciousness a knowledge of the ancient paths followed by the Finnish stock, has learnt most and best from the seers of Carelia. We picture the heather religion of the Finns, their ancient ceremonies and customs, their songs and music in past days, chiefly as they were in Carelia. Research has not yet succeeded in explaining all the accumulations of long ages which are reflected in these memorials of our oldest culture. It has been chiefly engaged in solving the problems hidden in the Kalevala lays. The curious *prose compositions*, originating from a primeval stage of development, which still survive where the Carelian dialects are spoken, have been left almost entirely disregarded. Only a passing glance has been given to the imaginative, poetic world concealed in these prose lays. These are preferred by the Carelians for marriages and burials, and the meaning of the words corresponds beautifully and harmoniously to the traditional ceremonies they accompany. There is no metre to prevent characteristic variations in language or in meaning from coming to expression in different regions or by individual singers. As for the structure of the Carelian prose lays, each

verse consists of a main or subordinate sentence of unlimited length, which is distinguished from the language of conversation by alliteration, parallelism, (repetition) and figurative language. These prose lays are generally known under the name of «weeping songs» — tears and weeping are common at important farewells, whether marriages, burials, or departures to the war. Although the Carelians' neighbours, the Russians, also use weeping songs on similar occasions, modern research has furnished many proofs that there is no truth in the common accusation that this custom is a foreign loan. Regarded as lyric poetry in any case, the Russian weeping songs are far below the Carelian.

Weeping Song from Kem Carelia, Sung at a Marriage.

$\text{♩} = 80.$

A lap - - - ses - - - te - len, loa - tu - al' - l'i - - - sen',
 loa - tu - - hy - - - vä - - - - - se - ni loas - - - ka - vil - la las - - -
 - - tu - - - pi - - - ha - - sil-[la] (a) loa - vun jä - - - -
 - ki - - - - mäi-set ker - - tai - set o - - - mil-la lak - lo-val - -
 - - tai - sil-lan' loa-vun as - - - sun - ta - - ai - - kai - sil - la - ni.

(The bride wanders on her father's beautiful, chip-strewn courtyard, playing as a maid for the last time.)

In Kem Carelia, north of the area to which the sung metrical runes properly belong, there also occurs prose poetry of an epic nature, called *joiku*. The name *joiku* is also known up in Lapland, and even as far south as Ingria. The Carelian *joiku* poems have the same structure as the weeping songs, and are chiefly distinguished from them by their subjects; thus for example, a mother or other female relation weeps for a young man who is away at the war, and a stranger, man or woman, sings a *joiku*. Then the *joiku* paints in moving language the thoughts of the warrior treading the paths of danger, and of the mother. In times of peace these songs generally describe the relations of young

men and maidens. They often express the »public opinion» of the village with regard to the love adventures of a modern Lemminkäinen. The poems being improvised, they are made to suit the actual time and conditions. There are clear traces of their use about five hundred years ago, showing how the Finn (vieromaalainen), »the man from the foreign land» visited Carelia (viljelennässä viilehysrauan) »to cultivate the sharp-edged steel». The numerous scornful and insulting words, such as »heikko» (poor wretch), »ilkiö (villain), »inhu» (good-for-nothing), »kehno-», »kiero-», »kurja-», (mischief-maker), »vainomaalainen» (enemy), clearly refer to the war of persecution on both sides of the frontier, of which we know from history. Now that the intercourse has become entirely friendly, these epithets are only used for the sake of alliteration and parallelism. The singer tries to remove the effect they might possibly have by the addition of friendly adjectives, such as »valoveri vainomoalain» (the fair haired man from the hostile land) and »kukkamarja kurjamoalain» (the flower-berry wretch), and even, in joiku language, urges the »stranger with the beautiful skin» (kauniveri kaihomoalain) to seek his beloved among the »fair birds of Carelia» (Karjalan kanasista).

The name of the joiku songs, their structure — whether they come from north or south (Kuittijärvi) — and its likeness to that of the Lapp joiku songs (for instance the use in both of the refrain, which is so characteristic of primitive poetry), and finally the fact that they have the same structure as the weeping songs, all suggest the hypothesis that in the Carelian prose poetry we have the oldest remains of runes from very ancient times. It is easily proved by research, especially in Ingria, that this primitive form of poetry gradually paves the way for metric poetry, more developed in both structure and content, and bequeaths to the latter the alliteration and parallelism from which it gets its beauty. Generally speaking, the same is the case with the melodies. Those for prose compositions are exceedingly free in the structure of musical metre and strophe, while on the other hand the Kalevala metre demands much less variety in these respects. The length of notes and the scale, on the other hand, show many points of agreement.

The *calling melodies and herdsman's melodies* are of the greatest interest in the history of folk music. The former are used on forest expeditions and similar occasions as signals, and the latter to call home the sheep and cows; they are disappearing in Finland, but are still in use in East Carelia. In the summer, the forests ring with the sounds of the *birch-bark trumpets*, with which the herdsmen frighten away the bears from the cattle. This practical necessity has kept alive a natural music the roots of which go back for thousands of years.

Carelian herdsman's melody

Tpru-ko leh - - mā-sein, tpru-ko-sein, tpru-ko!

(Tpru my little cow.)

Carelian birchbark trumpet melody

Up to now, the greatest attention has been devoted to the compositions which we have become accustomed to calling the Kalevala lays. The constant, simple, runic metre is characteristic of these, quite apart from the contents. Research has shown that they originate from the time when the Baltic Finns still formed a single unity. It is noteworthy that East Carelia did not as a whole fall within the zone of the ancient metric compositions; almost the whole of southern Olonets is outside it. The *lyric poetry*, the Kanteletar lays, has chiefly been collected in Finnish Carelia. The emotional poetry of East Carelia chiefly consists of the prose verse already described. The fact that there are but few remains of *bridal poetry* in East Carelia, compared with all that has been recorded from Ingria, does not mean that the wedding ceremonies were by so much the poorer; where a metrical lay is sung in Ingria, the Carelian «weeping women» sing a corresponding weeping song.

Bridal Song from Kem Carelia.

$\text{♩} = 69.$

Kok-ko len - ti koil - li - - - ses - - ta, kok-ko len - ti
 koil - - - li - - - ses - ta, is - ku - lin - - - tu il - man
 al - - ta, is - ku - lin - - - tu il - - - man al - - ta.

(The eagle flew up from the north east, the bird of prey from the wide heaven, etc.)



Fig. 39. Boy from Kivijärvi.
Photo *J. K. Inka.*





**Fig 40. Peasantry from the Village of Koikari. Lindajärvi,
Province of Povenets.**

Photo P. Eskola.





Fig. 41. Herdsboy with Horn of Birch Bark.
Province of Olonets.

Photo *A. O. Väisänen.*





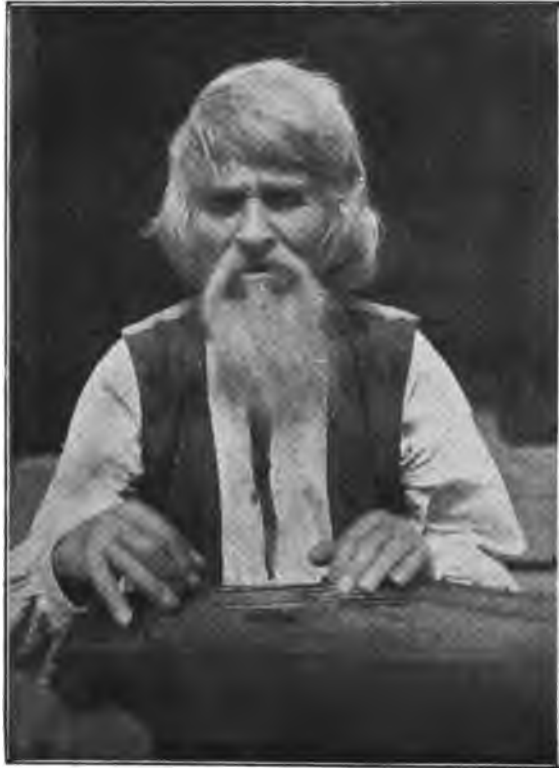


Fig. 42. Kantele Player, Kem Carelia.
Photo A. O. Väisänen.

One reason why lyric poetry is more cultivated in Ingria, and also in Estonia, is that there singing is one of the female functions. But »women's wisdom and children's memories do not belong to bearded heroes». Not till Carelian soil is reached do we hear those »deep words of origin, which not all children, nor all heroes sing». Only there, in the deep solitudes, in the mysterious forests and by the rushing torrents, could those mournful, deep and soaring magic songs grow up, which form such an important part of the Kalevala. By magic and spells, by the power of wisdom, of knowledge and of words, the Carelians tried to make the conditions of their lives agreeable. They sought by magic songs help for the success of their home occupations, their hunting, fishing and cattle rearing, and mortal diseases were banished by spells and prayers, to which the Carelian seer joined deep runes of origin, believing that in them he knew the origin of the disease, and therefore could heal it.

The Finnish spells are generally repeated in spoken language. There is no doubt that the most primitive method was to sing them, and this is seen, for example, in the Lapps' sacrificial songs.

However this may be, we know that Väinämöinen charmed all nature with his *kantele*. The most beautiful creation of Finnish imagination is the description in the runes of the making and playing of the kantele. The Finnish race has loved this instrument with a special affection. The kantele was most used in old Carelian territory, and there chiefly for dance music; it was also played in Olonets and in the south of Kem Carelia, up to the end of the last century. Our ancient Finnish five-stringed »Väinämöisen kantele» was most honoured for the performance of the melodies to which the ancient *epic lays* were sung, those runes which are combined into one whole in the Kalevala. This creation would have been impossible without frontier- and East-Carelia. It was from them, from their aged rune singers, that Lönnrot got the idea that these songs were fragments of a great epic which could still be reconstructed from them. He justly called the epic he published in 1835 »Kalevala, or ancient Carelian runes from the past of the Finnish peoples».

Typical Rune Melody (from Kem Carelia).

$\text{♩} = 104.$

lau-loi en-nen lap-pa-lai-ni, ve-jen van-hin vei-jot-te-li.

ko-ta-poi-ka kol-kut-te-li vaa-ran vas-ki-sen la-ka-l-la,

(In olden times the ancient Lapp sang, Raised his voice the water's oldest. The Lappish tent's son made notes jingle Up the copper mountain's fastness).

Nearly a century has passed since *Zachris Topelius the elder* showed the way to the best finding places for epic lays. Lönnrot then made his ever memorable expeditions to chronicle the lays, and Kem Carelia showed what treasures it possessed. Zealous efforts have been made to collect these treasures and bring them home to Finland. Many forest paths beyond the frontier can tell of *Castrén*, in search of incantations, *Europaus*, our most persevering collector of runes, *Meriläinen*, who preserved the arts of magic; in Kem Carelia *Borelius Lähteenkorva* began to glean the remnants which are so essential to research. The gigantic publication called »The Old Runes of the Finnish People» is the fruit of these collections.

Thus were the songs and legends of our forefathers reconstructed, and in the course of the work, the former political frontiers began to recede as it were of themselves. And yet the successors of the »eternal seer» — *Arhippa Perttunen*, *Ontrei Malinen*, *Vassila Kielöväinen* and others too, will scarcely ever know or realise of what importance they have been to the Finnish people. It is impossible to hear without emotion the verses of the last great Carelian rune singer, which pray to God to help great Finland. (»Auttaos hyvä Jumala Tuota suurta Suomennientä»). It is as if there were concealed in these words not only a blessing, but also a prophecy, for the fulfilment of which our people is waiting. The sons of the rune singers are already taking part in the work of creating a new, great Finland. The whole people of Väinölä has awoken to the thought of the heroic song, that man after man goes out »to win another lucky Sampo».

A. O. VÄISÄNEN.

III. ECONOMIC LIFE AND INTERCOURSE.

1. Agriculture and Cattle Rearing.

East Carelian agriculture is of small extent and primitive in its methods. The produce is therefore comparatively meagre. Burn-beating is discouraged by the state, and in some districts has almost died out, but methods have not thereby been improved in other respects. The backwardness of agriculture is not due to the climate, which is no severer than that of Finland, nor to the soil, which is similar to that in the interior of this country, and in places better. The reasons are to be sought in the general low grade of culture in this backward country, the lack of communications, and above all in the peculiar conditions of land ownership. It is difficult to judge how far it may also be that

the male population has no bent for agricultural work, as some who are acquainted with the country believe. I will only remark that this once free people has been crushed and oppressed, — as its sorrowful history shows —, the authorities have in every way restricted it in all its acts, even its right to the enjoyment of the soil, which the peasants may cultivate, but may not possess; is it then to be wondered at if they show very little disposition for work the fruits of which they cannot be sure of retaining and leaving to their children, and they are more inclined to fortuitous earnings? It cannot therefore be concluded that they are not suited for agriculture. The intelligence of the Carelians is generally recognised, and the husbandman, who has to direct his own labour, needs a high degree of intelligence, if he is to be successful. It cannot be supposed that a gift for poetry and music, and perhaps also a certain mysticism, need, generally speaking, interfere with the husbandry of a population. These characteristics are generally accompanied by a love of nature and its beauty which attach a man to rural life and its pleasures.

Let us now return to an examination of the external conditions which are essential to good husbandry. We shall then shortly describe the present state of agriculture and its yield.

The climate has already been described. Our account of the geology, geography and natural history of the country also gives an idea of the degree of fertility and the possibilities of cultivating this territory. Dr. LINKOLA has been so good as to put together the results of botanical observations, with the special object of throwing light upon the productiveness of the soil. He has applied a modern method of obtaining a survey of the fertility and different characteristics of the soil in different areas, by means of a cartographic record of the places in which carefully selected plants which require good or particular kinds of soil, are found. This method is specially applicable to areas where agriculture has not itself yet afforded sufficient information on these points. Dr. Linkola himself writes about his procedure; —

As direct research into the quality of the soil of East Carelia and the Kola Peninsula has not yet been carried out, it has been suggested that the fertility of the soil might be estimated from the information at present available as to the flora and vegetation of the area. A number of investigations carried out in this country during the last few years afford good hopes that this method will prove satisfactory.

All the information at present available as to the distribution over the area of the more exacting phanerogams and ferns which demand fertile habitats was collected from botanical literature (*Bergroth, Brotherus, Cajander, Elfving, J. Fellman, N. I. Fellman, Hjelt, Kairamo, Kivilinna, Lindberg, Lindén.*

Norrlin, V. Nylander and Vainio), from botanical manuscripts (*Bergroth*, comprehending notes of four summer excursions, *Brotherus*, *Cajander*, *Günther*, *Linkola*, *Sahlberg*, *Vainio*, etc.) and from the specimen plants in the university herbaria. Five different maps were then drawn showing the distribution of the more exacting species in the districts mentioned. For this purpose only those species were taken into account which are distributed over the whole area, including its northern portions, more or less independently of climatological factors. — The maps show the distribution over the area in question of the more exacting plants which require respectively (1) luxuriant groves, (2) fertile forest bogs, (3) quagmires and flat marshes, (4) mountains, (5) sheets of water.

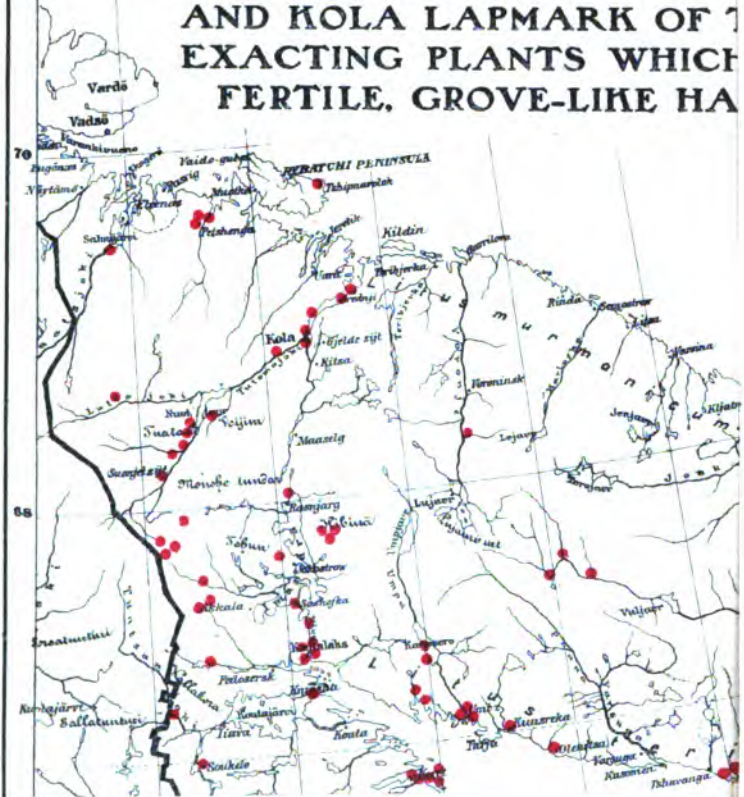
They show, mutually supplementing and confirming each other, in which districts the soil is so fertile that the plants in question can occur.

The close agreement of the botanical conditions shown by the maps cannot fail to attract attention, and they give in main outline a very informative survey of the relative qualities of the soil. I have also drawn another map, in order to attain greater perspicuity and certainty, and in order to supplement the maps based on plants found, especially with regard to districts that are incompletely known, or from a botanical point of view entirely uninvestigated. In this other map I have used as the basis for investigation into the quality of the soil, not only botanical information but also general descriptions of the district (statements as to the barrenness or fertility of the district, information as to the undergrowth in the forests, the growth of the trees, the hay produced by the bogs, etc.) These are found in the botanical publications and manuscripts already mentioned, and in other descriptions of travels from districts which have not been visited by botanists (*Ervast*, *Inha*, *Lönnrot*) and have also been obtained verbally from persons who have travelled in the districts in question (*E. Ahtia*, *A. K. Cajander*, *L. Hannikainen*, *I. Härkönen* and *J. E. Rosberg*).

If the maps be examined with special reference to circumstances which are of importance for agriculture and forestry, they show in broad outline the following qualities of soil in the area in question;

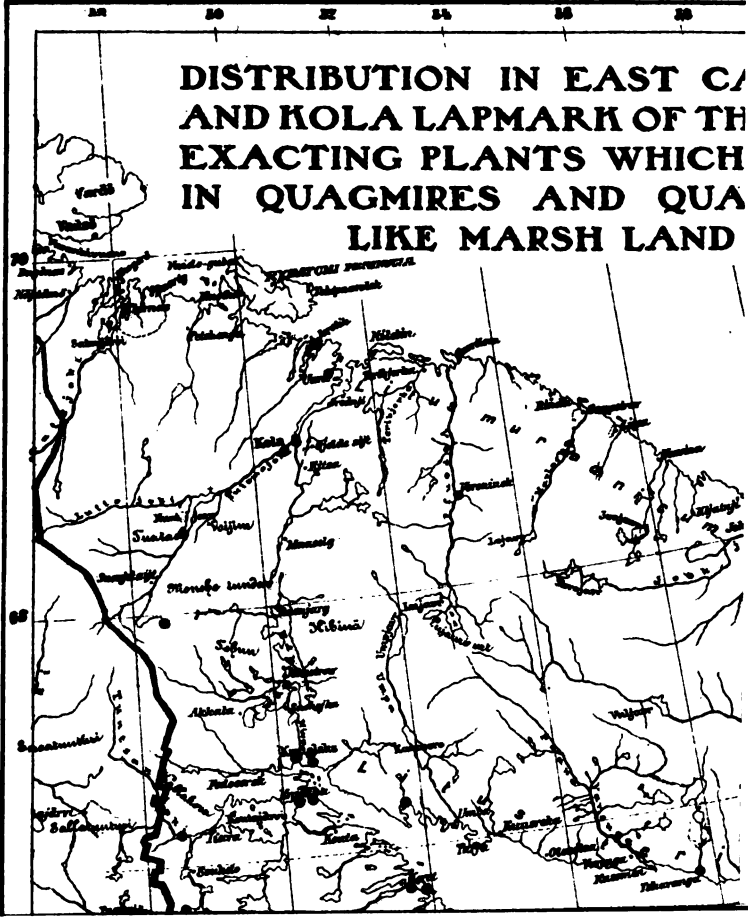
Really fertile soil well suited to agriculture is only found to any large extent in the southern part of the area, on the coastal belt round lake Onega, especially on the Zaonezhie peninsula, and thence for some distance inland in the districts to the west. In the Wepsian territory also, northwards from the Svir, most of the soil is very fruitful. There is also fertile land round the middle and upper reaches of the Svir, and round the tributaries of that river; also in particular parts of Olonets which border on the Finnish parishes of Salmis

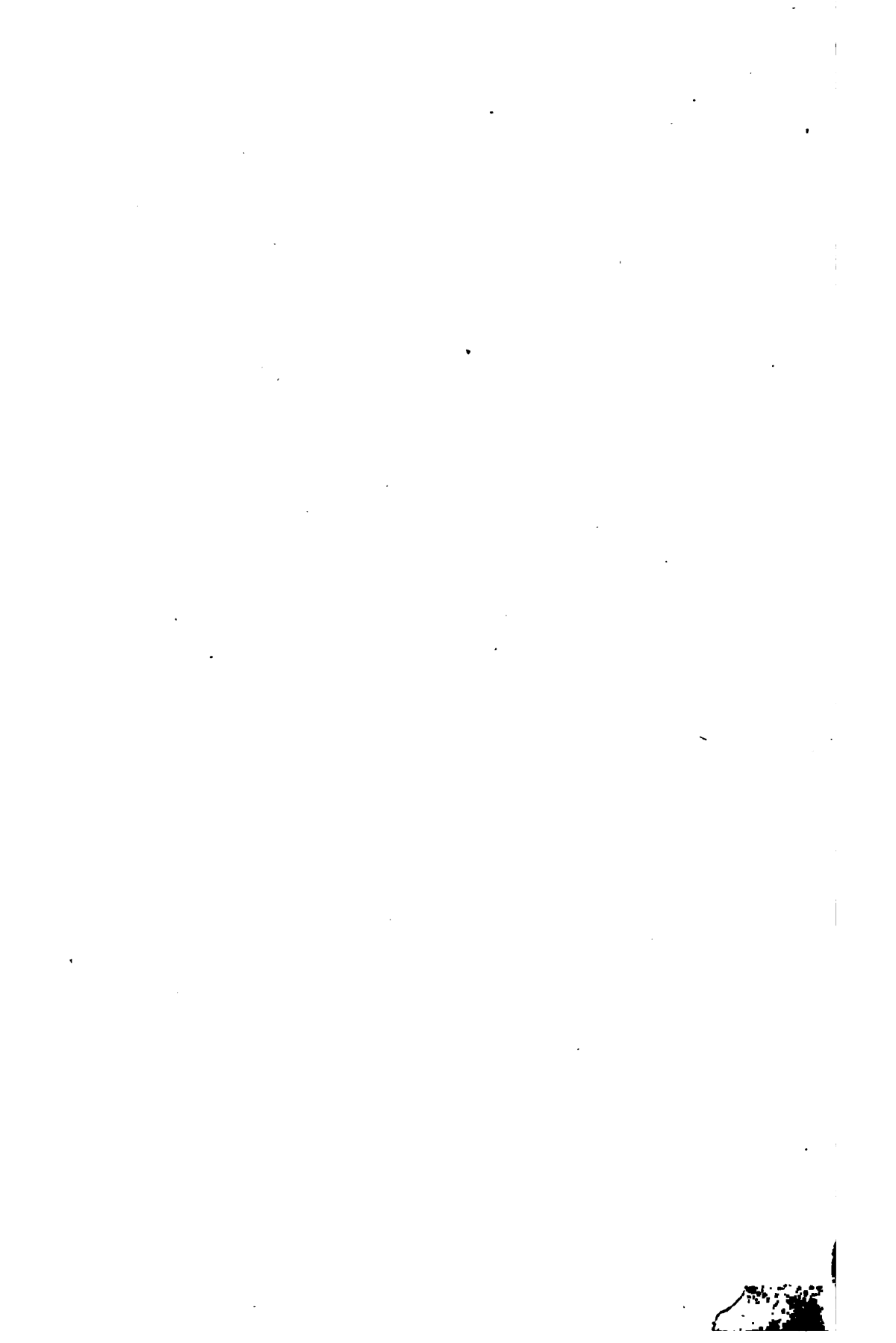
DISTRIBUTION IN EAST AND KOLA LAPMARK OF EXACTING PLANTS WHICH FERTILE, GROVE-LIKE HA





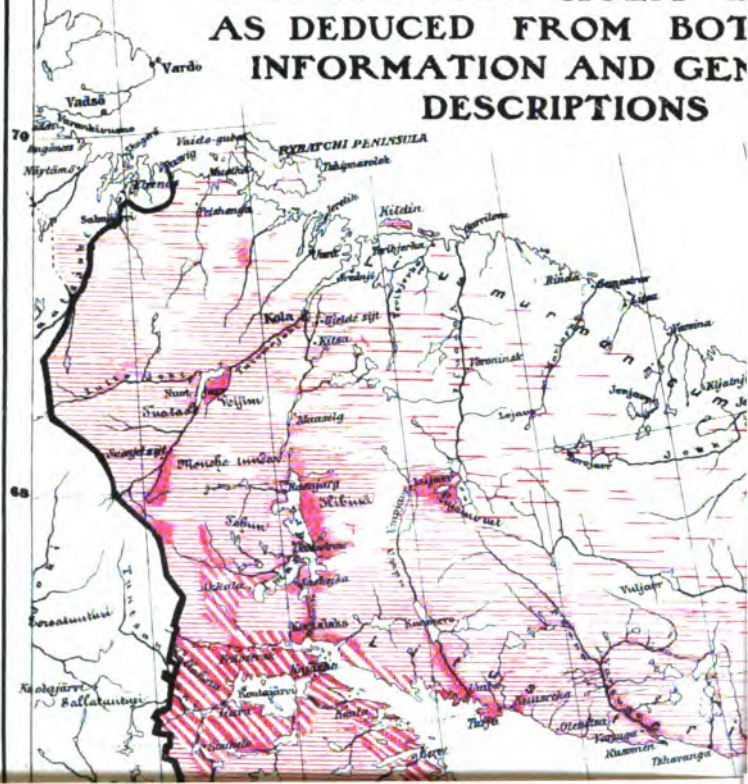
DISTRIBUTION IN EAST CA
AND KOLA LAPMARK OF THE
EXACTING PLANTS WHICH
IN QUAGMIRES AND QUA
LIKE MARSH LAND

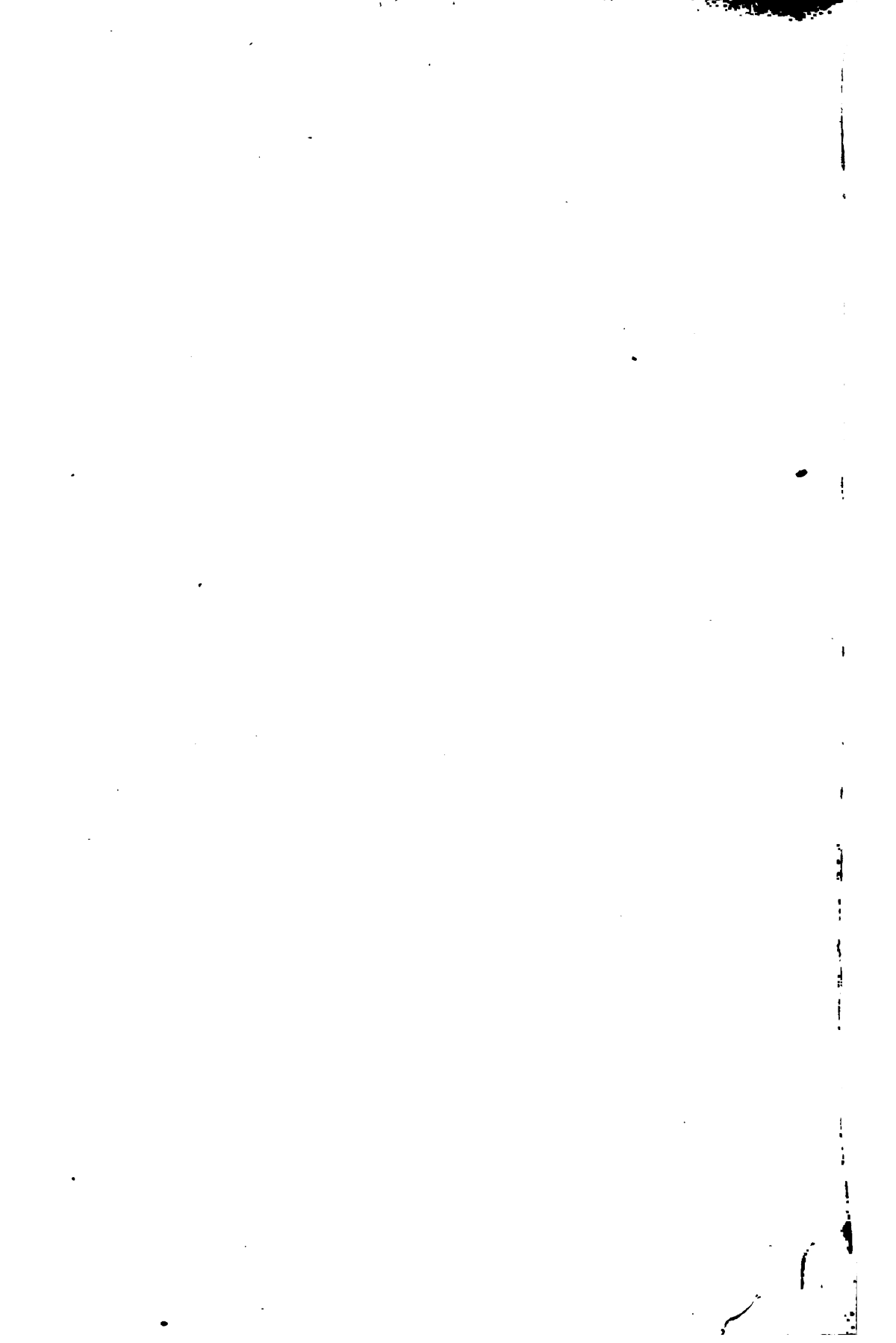




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QUALITY OF THE SOIL CARELIA AND KOLA L AS DEDUCED FROM BOT INFORMATION AND GEN DESCRIPTIONS





and Suojärvi, as well as in the regions round Onega and Seesjärvi. The fertility of these tracts is to some extent shown by the fact that they are inhabited by an agricultural population, which is numerically far the most important part of the population of East Carelia. There seem here to be good prospects for a much larger agricultural population, especially if bog-cultivation is assisted. Further north, fertile soil only occurs locally in rather scattered tracts and along the rivers. As far as can be judged, the only extensive area suitable for cultivation between the Uikujoki and the Kemijoki is the region round Tunkue-Suikatjärvi and Uskela, where the bogs, in particular, certainly furnish good soil. Along the coast of the White Sea there are extensive clay districts, as to the cultivability of which nothing can at present be said with certainty.»

Dr. Linkola has collected information as to the occurrence in different tracts of about fifty species which are little affected by the variations of climate within the area. He has then classified them in the five groups and expressed these cartographically, as he explains above. In addition, the occurrence of about 150 other exacting plants has been noted, and these are considered in the summary. As the five botanical maps give remarkably similar results, we only reproduce two of them, namely that for luxuriant groves and that for quagmires and marshes, which seem to be the two most informative for our purpose, together with the final resultant map showing the quality of the soil in the various regions. Dr. Linkola has himself described the result, so that I need not here give it in more detail. The results with regard to forest plants are not quoted here.

As Dr. Linkola says, the results agree with what is suggested by the agricultural conditions and density of population. There is particularly fruitful land north and west of Onega, and by the southern part of the present frontier, and further north also the soil is very good in some places. Specially noticeable is the generally excellent quality of the bogs, which are, however, almost entirely uncultivated, easy though their cultivation would be. An experienced agriculturalist said of them that «they sometimes make one's mouth water». The better quality of the bogs east of Maanselkä, compared with those in this country, may be due to the amount of lime in the soil, which is frequently greater east of that ridge. This is also noticeable in this country at Kuusamo, which is on the eastern side of Maanselkä.

Thus the lower level of agriculture in East Carelia is not due to a specially disadvantageous climate or poor soil. It is the general poor conditions of civilisation, the backwardness of this part of the country in all spheres of life, — or to speak plainly, the oppression of the foreign, more powerful usurper, — which has caused agriculture also to remain at so low a level. That

usurper has done nothing to improve conditions, but much to hinder, to which has recently been added the ardent policy of denationalisation, and violent persecution of every one who tried to work for enlightenment and improvement in any sphere. The government has certainly established a couple of small agricultural schools — Russian ones of course, — and sent out a few agricultural experts, generally with a spying policeman following close on their heels (Fig. 46). No results worth mentioning have been observed from these measures.

The most important and most obvious cause of the decay of agriculture is the troublesome condition of *land ownership*. Stolypin's far-sighted land reform of 1910 in Russia, which divided up the land belonging to the village community and jointly owned by the different homesteads, so that each homestead obtained land which really belonged to it, has not yet been introduced into East Carelia. Only two, of the many travellers I have questioned about this, have reported work in this direction being done in a couple of villages, and they could not state whether the reform had really been carried out even in these. The reform here had been received with satisfaction. In other places where the reform had been talked of, those who knew about it received the idea with distrust.

Thus there still prevails throughout East Carelia the well known, ancient institution of the *mir* (village community). This is a survival from the time of serfdom in Russia, but changed, in that while the soil formerly belonged to the estate owner, and the village community, as such, paid him a tax for the right to use it, it is now owned by the village community, which pays a tax to the state, since the village community bought the land, the state acting as intermediary.

It is true that the Russian serfdom was never introduced into East Carelia, except on the few large estates which grew up during and after the time of Peter the Great, but after the Russian conquest (see historical section), conditions gradually so developed that the greater part of the soil belongs to the state. In the province of Kem the state owns practically all the land, while the different homesteads or households only have the *right of usage* of their respective portions of the land of the village community, as under the institution of the *mir*. Both these rights of usage in the soil and the taxes to the state for which the village community as a whole is responsible, are shared out every fifteenth year or oftener, among those who have a right to a share, — either the different homesteads or households, or the male population of the village, the custom differs somewhat in different cases. This division is made at a meeting of the whole community, i. e. of those who own shares, at which the

«eldest» (starosta) of the village is chairman. If the village community or obshchestvo includes several villages, as is usually the case in these three provinces, the elderman of the commune (strashina) conducts the proceedings. As, however, those who own shares are responsible as a body for the payment of the taxes, and this is inexorably enforced, those who have any possessions are obliged in case of difficulty to pay for the whole, which is no encouragement to the improvement of agriculture by hard work, industry and thought.

The *last great division of the land* took place in the year 1896, and then all male individuals in the communities, including children, were allotted land to cultivate. The next great division ought to have taken place in 1911, but was not held, because both the Act of November 9th, 1906 (which was in the same direction as Stolypin's Act) and the latter's Act of 1910, had then been promulgated. The children of 1896 are now grown up, and as the necessary adjustments (in case of death etc.) have been made yearly, it may be considered that every male who wants to till the soil has land to cultivate. That is of course excellent, and some foreign writers have found in this institution an ideal solution of the problem of land for the unsettled. If any one moves away his land is given to others, but also idlers and those who have not been able to pay taxes may lose their right to the soil, and even be expelled from the village. All this may be an advantage. But it may also happen that many a poor wretch can succeed in moving the chairman and those of influence in the community to clemency, for example by means of a good supper. It may also happen that some such wastrel can convince those who have to decide, that the poor results of his tillage are not due to his own neglect, but to his having been allotted a particularly bad piece of land. He may thus obtain a supplementary piece of good land, at the expense of some one who has got his land into such condition that he seems to have too much of the good soil.

In general, however, all went well and justly in Carelia until at the beginning of this century the state began to extend its interference to these affairs. From the ruler of the government and the highest police authority, down to the bailiffs and lower police officials, not to speak of the authorities whose duty it was to supervise the zemstvos and the whole of the provincial self-government, all interfered in the affairs of the communes, village communities and villages. They persecuted every one who was suspected of working for the rights and interests of the communal institutions, and especially those who were denounced as opposing the methods of russification then in progress, by means of Russian elementary schools and other more violent methods. We know that régime only too well from the time of Bobrikoff and Seyn here in Finland, when adventurers and wastrels came to the top. On Carelian terri-

tory, any one who wanted more land or other advantages only needed to denounce another, and the one denounced was in every way persecuted. It was a hard time for all Carelians and Finns, and those who knew even a little Russian tried in every way to conceal their nationality from the authorities. This naturally had anything but a favourable effect on the progress of agriculture, here as elsewhere.

In passing now to the *statistical treatment* of the conditions of land ownership, we must state, unfortunately, that the figures available as to the areas owned by the state, individuals and the village communities are very variable, and that this is due to a number of circumstances. First, the total area of the three provinces, including water, is given by Strelbitski as follows;

Olonets	.....	12,543 sq. km.	(about 4,900 English sq. miles)
Petrosavodsk	.....	21,776 » » »	8,500 » » »
Povenets	.....	45,709 » » »	17,850 » » »
All three Provinces	.....	80,028 » » »	31,250 » » »

According to planimetric measurements made on our maps the area is;

Olonets	.....	12,120 sq. km.
Petrosavodsk	.....	21,620 » »
Povenets	.....	44,785 » »
All three Provinces	.....	78,525 » »

The difference is fairly considerable, but has no significance here, as we are now seeking information with regard to the area of the *land*, and its *division* between the various interested parties. It is more serious that the figures in this respect also are very variable.

It becomes therefore necessary to quote a few different calculations. This may perhaps also prove of service to any one who may need data as to the conditions of land ownership and area in these districts, and finds in the various sources the figures given below, or even others, and soon notices that these do not agree with the corresponding figures given in other works. The area of the three provinces, *excluding water*, has been given as follows;

	Olonets	Petrosavodsk	Povenets	All three provinces
I. by Strelbitsky	9,234	14,935	40,105	64,274 sq. km.
II. { various }	10,814	15,577	40,973	67,364 » »
III. { official }	9,523	15,462	40,880	65,865 » »
IV. { sources }	8,260	13,656	39,060	60,976 » »

Some of these differences are very large. They may partly arise from differing figures obtained by the measurement or estimation of the areas of the land owned in different ways, from which the totals for each district have been compiled, and partly also from different views of the actual conditions of ownership, so that the same piece of land may on different occasions have been placed in different categories, and so either counted twice or entirely omitted in calculating the total. The following short exposition will show how vague the distinction between different systems of ownership are, so that sometimes even the three main categories, ownership by the state or public institutions, by private owners, and by village communities, are themselves somewhat indefinite. Various writers and statisticians also complain that they have been unable to obtain from others clear information as to this and that condition, owing to the various meanings of the terms in different contexts. The same difficulty has also caused us no small trouble.

The differences between the figures from sources I. II. and III. are great, but those from source IV. differ still more widely from all the rest. This may possibly be due to the large tracts of land belonging to the mines under state control being here omitted. The category of land belonging to «the state and public institutions» usually includes both land owned directly by the state, and that belonging to mines, the towns, and monasteries, the church land, appanage lands, and the smaller areas belonging to other institutions. The land belonging to mines in these three provinces forms a total of 8,332 sq. km. (far the largest part of it in the province of Petrosavodsk) and if added to the figures of 60,976 sq. km. given for the total area of this province would therefore give an even higher figure than the other calculations. If each province is taken by itself, there is even less agreement. A large number of circumstances into which we cannot go here may have contributed to the very various results shown by the different calculations. It seems certain that the results of calculation III. come nearest to the truth, and that is therefore the one used in what follows.

We now turn to the *division of the land* between the three main categories of owners; the state and public institutions, private owners, and the peasant communities. Happily, the figures dealing with ownership by communities, which are for us the most important, seem to be fairly reliable. They are based on careful investigations by the zemstvo of the government of Olonets, made when M. KUSNETSOFF was chairman, and they are regarded by all writers on the subject as particularly reliable. But for these investigations, it would have been practically impossible for us to give any statistical treatment of the conditions of agriculture and land-ownership in these three

provinces. The figures as to private land-ownership seem also to be fairly trustworthy. There may, however, be some uncertainty in both these groups, from a member of a community also buying himself a plot of land, and not necessarily a small one, either from persons belonging to the same community who have other occupations than agriculture, or from private owners or from the state land. There are also cases of land being rented for periods of forty years from the state, and possibly also from other owners.

Areas of land owned by the state, by private owners, and by peasant communities, expressed in hectares and in percentages of the total area of the district.

Province	Land area of the province	Land belonging to the state and public institutions		Land belonging to private owners		Land belonging to the village communities	
		hectares	%	hectares	%	hectares	%
Olonets.....	952,339	499,189	52.42	4,722	0.50	448,428	47.09
Petrosavodsk	1 546,189	601,625	38.91	62,356	4.03	882 208	57.06
Povenets	4,088,032	3,447,349	84.33	3,656	0.09	637,027	15.58
Whole area..	6 586 560	4,548,163	69.05	70,734	1.07	1,967 663	29.88

As we see, there is but little land belonging to private individuals, only 4% of the whole in the province of Petrisavodsk, 0.5% in Olonets, and not as much as 0.1% in Povenets. In Olonets the peasants and the state each own about half of the soil, in Petrosavodsk the peasants have rather more and the state rather less than half, but in the extensive and slightly cultivated province of Povenets, the state owns over 84% and the peasants not quite 16% of all the land.

Land belonging to the state and public institutions, expressed in hectares.

Province	The state	The towns	Religious houses	The church	Other institutions	Total
Olonets.....	487,184	5,282	5,263	1,446	14	499,189
Petrosavodsk	573,872	16,682	7,250	3 812	9	601,625
Povenets	3,420,363	21,616	4 991	371	8	3,447,349
Whole area..	4,481,419	43,580	17,504	5,629	31	4,548,163

This table shows roughly how the land belonging to the state and public institutions is divided between the various bodies. We include under land belonging to the state the so-called «mines land», which is administered by the Mines Board, or now to some extent by the Board of Forestry, but naturally belongs to the state.

Thus, in comparison with the state-owned area, all the other institutions have very small shares, though those owned by the towns, of which there is one in each province, are in themselves quite considerable. The religious houses', and especially the church's land, i. e. the glebe, is on the other hand strikingly small, in relation to the large areas in which one usually reckons in these provinces. As the only religious house in the province of Povenets, which was also the only nunnery in East Carelia, «The Convent of the Mother of God», was dissolved in the year 1890, it is possible that its land accrued to the state, or was otherwise disposed of, seeing that some statistics give no land at all in Povenets as belonging to religious houses.

The land belonging to private individuals was in the year 1906 distributed as follows;

Land belonging to private owners, expressed in hectares.

Province	Nobles	Merchants	Peasants'	Industries	Total
Olonets.....	2,664	659	1,399	—	4,722
Petrosavodsk	4,685	9,439	45,904	2,328	62,356
Povenets....	1,714	1,941	—	—	3,655
Whole area..	9,063	12,039	47,303	2,328	70,733

These figures show that there is in Petrosavodsk a comparatively large amount of land belonging privately to the peasants. Otherwise there is but little land in private hands, whether nobles', merchants' or industries (excluding state industries).

We now pass to what is for us the most important question, namely the ownership and cultivation of land by the peasant communities.

Even though the land was divided at the great division of 1896 among all the males, the father of a family naturally administers the children's share, as their natural guardian. The son of an agricultural peasant in East Carelia almost always marries very young, and thus there come to be several families in the same homestead. (Unmarried men are so rare among the land-owning population that the word «purlakka» is used both for a batchelor and for one

who owns no land). In the north of East Carelia it is more usual for the young families to form households of their own on the old homestead, but in the three provinces with which we are now specially dealing all the inhabitants of the homestead usually form a single household, one large family. This is ruled fairly strictly by the «elder of the homestead», which however does not always mean the same as the oldest in years, whom all must obey. We use the word «homestead» therefore, as it is used in the report of the Olonets government zemstvo, although it is possible that the primary figures on which the statistics are based sometimes refer to households, as the average number of persons on these homesteads (the rural population divided by the number of homesteads) is scarcely seven in Petrosavodsk and Povenets, and only five in Olonets.

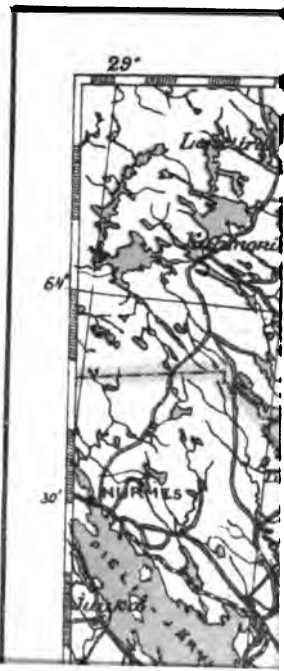
The number of village communities, villages and homesteads is as follows;

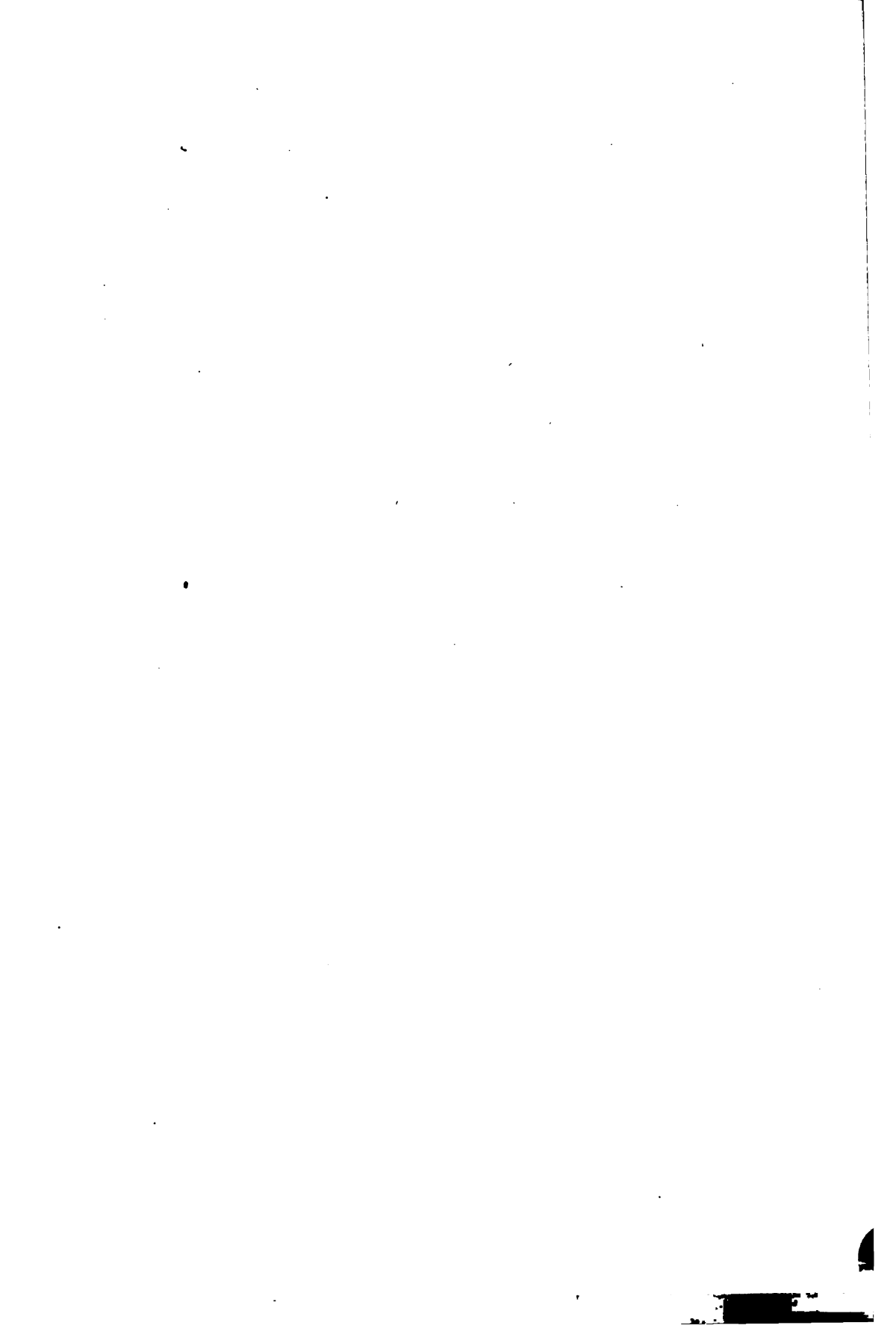
Number of village communities, villages and homesteads in the year 1902.

Province	Village communities in the province	Villages				Homesteads		
		In the province	In the community			In the province	In the community	In the village
			max.	average	min.			
Olonets.....	129	557	34	4.32	1	7,800	60.47	14.00
Petrosavodsk	121	663	37	5.48	1	12,304	101.60	18.15
Povenets....	180	393	64	2.18	1	4,417	24.54	11.21
Whole area..	430	1,613	64	3.75	1	24,521	57.08	15.20

As this table shows, and is also well known, the villages in this region are fairly large, averaging about fifteen homesteads. The village communities contain an average of three to four villages and fifty-seven homesteads, but they usually consist of one, two or three villages, while in exceptional cases there may be scores.

The following figures show the extent of the land held. The term productive land is here used to include arable, meadow, pasture and burn-beaten land, and productive forest, and also building sites, in accordance with the usual custom. Waste land includes bogs and marshes, and as these are often of excellent quality, the area of land which could be utilised is really rather





larger and the waste land less than the figures in the corresponding columns show.

Average area of land per village community, per village and per homestead, expressed in hectares.

Province	Per community			Per village			Per homestead		
	Productive land	Waste	Total	Productive land	Waste	Total	Productive land	Waste	Total
Olonets	2,551	925	3,476	591	214	805	42.2	15.3	57.5
Petrosavodsk ..	4,741	2,550	7,291	865	465	1,331	57.4	25.1	71.7
Povenets	2,018	1,521	3,539	924	697	1,621	82.2	62.0	144.2
Whole area	2,944	1,632	4,576	785	435	1,220	51.6	28.6	80.2

This gives for each homestead an average of eighty hectares of land, of which over fifty hectares are productive. In the province of Povenets the corresponding figures are over 140 and 80. The land belonging to a village averages 1,200 and that of the communities about 4,600 hectares. In Petrosavodsk, however, the communities run larger, with an average of about 7,300 hectares. The productive land forms about two-thirds of the whole, or if the easily cultivable bogs are included in this category, somewhat more. It must here be noted that a number of homesteads in Petrosavodsk have also been able to buy some land of their own, and that in 1905 the ground thus alienated to private ownership amounted to 45,799 hectares, or 5.1 % of the land belonging to the communities. In the province of Olonets, land thus redeemed amounted to 1,396 hectares, or 0.47 % of that belonging to the communities. This kind of redemption has not taken place in Povenets. It may further be noticed that some of those who own shares in the communities, such as merchants, smaller craftsmen, etc., have only their house-plot out of the common land, and that this is regarded as their own (i. e., it cannot be exchanged or shared out to any one else) but that nevertheless they are liable to share in the joint taxation of the community in respect of these plots. This forms a kind of tax on building lots, as opposed to the usual taxation in the communities, which is calculated on agricultural land. This makes the shares in the land belonging to real tillers of the soil slightly larger than the averages shown in the above table.

*Kinds of Land belonging to the Peasant
Petrosavodsk and Povenets of the Govern*

Province and Commune	Population	Number of Homesteads	Building sites	Ploughed land
			H e c	
<i>Province of Olonets:</i>				
Tulemajärvi	2 888	593	42.5	552.0
Vieljärvi	5 344	987	50.7	1 833.5
Videle	5 162	1 027	102.3	1 912.2
Kotkatjärvi	3 466	614	58.6	1 093.2
Riipuskala	6 316	1 300	185.0	3 557.1
Vaasheni	6 109	1 083	103.1	1 580.0
Njekkula	6 659	1 268	135.8	3 198.7
Mätysova	5 034	928	74.9	1 366.6
Total	40 985	7 800	752.9	15 093.3
<i>Province of Petrosavodsk:</i>				
Munjärvi	6 133	1 026	74.5	2 164.0
Kontu Pohja	8 349	1 295	87.5	2 716.4
Suurlahti	11 228	1 630	113.0	4 779.0
Tulvoja	12 026	1 721	147.9	5 853.7
Säämäjärvi	7 457	1 279	75.3	2 940.9
Suoju	7 807	1 286	127.6	2 792.2
Pyhäjärvi	3 682	638	38.2	1 390.6
Ladva	6 249	1 177	97.1	1 752.6
Soutjärvi	9 589	1 638	195.0	3 214.5
Ostretshini	3 251	614	59.9	869.7
Total	75 771	12 304	1 016.0	28 473.2
<i>Province of Povenets:</i>				
Rukajärvi	2 073	368	22.8	465.5
Repola	1 804	261	29.1	314.0
Porajärvi	2 162	357	29.9	392.6
Paadene	4 084	650	49.5	1 142.2
Petrovko-Jam	2 716	451	42.3	558.0
Mäntyselkä	4 053	647	65.3	1 093.2
Sunku	7 537	1 224	145.2	3 676.2
Danilova	1 869	309	43.2	515.0
Rimskaja	940	150	10.8	420.5
Total	27 238	4 417	438.1	8 577.2
Whole area	143 994	24 521	2 207.0	52 143.8

L E I.

*Communities in the Provinces of Olonets,
ment of Olonets, in the Year 1902.*

Meadow	Wooded pasture and burn- beaten land	Forest	Bog, swamp and waste land	Total	Percentage of plough- ed land to the total area belonging to the communities	Amount of plough- ed land per home- stead in hectares
t a r s						
1,622.7	1,610.0	33,989.0	18,264.9	56,081.1	0.98	0.98
4,953.9	3,261.2	51,227.9	27,131.9	88,459.1	2.07	1.86
3,439.1	780.4	33,463.7	10,969.8	50,687.5	3.77	1.86
2,387.7	1,797.9	25,277.4	6,209.7	36,824.5	2.97	1.78
5,848.6	53.1	22,943.3	9,114.9	41,702.0	8.53	2.74
3,167.7	2,076.6	45,123.9	20,978.7	73,030.0	2.16	1.46
4,368.6	80.5	33,192.0	14,190.8	55,175.4	5.80	2.52
2,345.6	536.1	29,749.0	12,396.9	46,469.1	2.94	1.47
28,133.9	10,195.8	274,966.2	119,286.6	448,428.7	3.37	1.94
4,952.2	737.5	51,834.1	50,876.1	110,638.4	1.96	2.11
6,236.9	1,033.1	73,696.2	53,965.7	137,735.8	1.97	2.10
10,944.8	379.6	56,661.9	21,636.6	94,514.9	5.06	1.93
12,830.9	118.6	34,604.7	19,330.1	72,945.9	8.02	1.30
8,420.7	1,847.9	66,400.9	62,982.5	142,668.2	2.06	2.90
7,872.7	175.3	37,364.9	22,024.5	70,357.2	3.97	2.17
5,183.8	1,807.8	38,031.1	28,506.8	74,958.0	1.86	2.18
6,476.8	117.7	35,728.2	26,775.3	70,947.7	2.47	1.49
7,379.8	506.9	56,929.0	12,107.6	80,332.8	4.60	1.96
2,353.7	0.8	13,485.9	10,339.2	27,109.2	3.21	1.42
72,712.3	6,725.2	464,736.9	308,544.4	882,208.1	3.23	2.31
1,394.5	31.8	26,944.8	28,948.5	57,807.9	0.81	1.26
1,334.3	154.3	58,744.7	77,894.0	138,470.4	0.23	1.20
1,756.7	461.6	36,280.5	29,932.1	68,853.4	0.57	1.10
2,139.7	590.7	64,384.2	28,437.4	96,743.7	1.18	1.75
2,057.4	83.1	27,244.1	32,686.0	62,670.9	0.89	1.24
2,752.6	2,835.5	56,469.7	43,545.5	106,761.8	1.02	1.69
5,655.5	590.7	37,533.7	20,874.8	68,476.1	5.37	3.00
1,569.6	57.2	14,216.9	7,779.4	24,181.2	2.13	1.67
795.6	292.4	7,860.6	3,771.6	13,061.5	3.22	2.80
19,455.8	5,007.3	329,679.2	273,869.8	637,026.9	1.35	1.93
120,302.0	21,928.3	1,069,382.3	701,700.3	1,967,663.7	2.65	2.13

As is shown by the figures quoted, the peasants have a fair amount of land, but this bright side of the question is completely changed when we notice how little of all this fertile land is really cultivated, and how primitive the method of cultivation is. This is shown by table I., compiled from the very detailed figures given by the zemstvo of the government, which show the extent of cultivation in the various communes of the three provinces now under consideration. (1)

This table shows that cultivated land forms only a small percentage of the total area owned by the communities; — 2.65 % in the whole region, something over 3.37 % and 3.23 % in the provinces of Olonets and Petrosavodsk, but in Povenets only 1.35 %.

The results of table I. are shown graphically in diagram I. The circles are drawn round the most important place in each commune, and the different coloured sectors represent the proportional extent of the different kinds of land belonging to the communities in the communes, the whole circle thus representing the whole area of land belonging to these communities. The map is drawn to the scale of 1; 200,000, so that a square centimetre on the map represents 400 square kilometres, or 40,000 hectares. As these provinces include scarcely any cultivated land other than that belonging to the communities, the size, or rather smallness of the narrow yellow sectors which indicate ploughed land gives a good idea of the conditions in these regions. All the land described as meadow is natural. Sown meadow land is still only to be found in a few scattered places in the south, and, in the north, near Seesjärvi.

Table I. and the corresponding graphic map I. show how both the area owned by the communities and in particular the area of ploughed land increases from the north-west to south-east, or towards the shores of Lakes Ladoga and Onega. In the north-west the circles on the map which indicate land belonging to the communities are small and thinly scattered, while in the south and south-east they are much larger and overlap. The proportion between the ploughed land and the whole area owned by the village communities again, rises in the province of Povenets from 0.23 % at Repola, in the north-west near the Finnish frontier, to 5.37 % at Sunku on the Suurlahti arm of Onega, in Petrosavodsk from about 2 % in the regions round Munjärvi to 8 % at

(1) Since the above statistics for the year 1902 were compiled the number of communes has been increased by the formation of new ones, namely one new commune in Olonets, two in Petrosavodsk and one in Povenets. This does not affect the final totals for the different provinces.

Tulvoja on the shore of the Suurlahti arm just mentioned, and in Olonets from 0.98 % in Tulemajärvi to 8.53 % at Ripuskalas south east of the former places.

The following little table is compiled from the figures in table I. and shows

The kinds of land owned by the communities expressed in percentages of their total property.

Province	Building sites	Ploughed land	Natural Meadow	Wooded Pasture, and burn-beaten land	Forest	Bog, swamp and waste land
Olonets.	0.17	3.37	6.27	2.27	61.32	26.60
Petrosávodsk	0.12	3.23	8.24	0.76	52.68	34.97
Povenets	0.07	1.35	3.05	0.79	51.75	42.99
Whole area. . .	0.11	2.85	6.11	1.11	54.35	35.66

Here we see that ploughed land and natural meadow together form 8.76 % of the land belonging to the communities in the whole area, namely 4.40 % in Povenets, 11.47 % in Petrosávodsk, and in Olonets 9.64 %; wooded pasture and burn-beaten land form 1.11 %; and are most frequent in Olonets, where they constitute 2.27 %. Forest is about 54 %, highest in Olonets with 61 %. Bogs and waste land come to about 36 % and are lowest in Olonets, or 26.6 %.

It is possible to make an instructive comparison of agricultural conditions in East Carelia and in Finland, by using the accurate account published by the well known »subcommittee» appointed in 1902 to enquire into the conditions of agriculture and the rural population; (HANNES GEBHARD; Atlas de statistique sociale sur les communes rurales de Finlande en 1901, Société de géographie de Finlande 1908). It is here in place to denote the extent of cultivated land not only as a proportion of the total amount of land owned by the cultivators, but also in proportion to the total land area of the three provinces. Now we know that the cultivated land in East Carelia other than that belonging to peasant communities is exceedingly little, except in the province of Petrosávodsk and that there too it is of no great significance. In the following table therefore, we show the ploughed land owned by the communities expressed as a percentage first of the total area belonging to them, and then of the total land area of the province. The Finnish committee already mentioned has pre-

pared statistics of the arable area in each of the communes of Finland. As the state and forest companies own comparatively little cultivated land, we can here too, without perceptibly invalidating the comparison with East Carelia, denote the amount of ploughed land in each province on the one hand as a percentage of the total land possessed by the land-owners, and on the other hand as a percentage of the total area of the province.

Area of ploughed land, expressed as a percentage of all the land belonging to the cultivators and of all the land in the province.

Province		Area of ploughed land, expressed as a percentage of			
		the land belonging to the cultivators		all the land in the province	
Finland	East Carelia	Finland	East Carelia	Finland	East Carelia
Nyland	—	18.75	—	16.65	—
Åbo and Björneb.	—	17.84	—	15.29	—
Tavastehus	—	14.27	—	11.85	—
Vasa	—	11.72	—	9.51	—
St. Michel	—	6.45	—	5.61	—
Viborg	—	6.54	—	5.22	—
Kuopio	—	4.40	—	3.11	—
—	Olonets.....	—	3.97	—	1.58
—	Petrosavodsk	—	3.23	—	1.84
Uleåborg	—	1.99	—	0.56	—
—	Povenets ..	—	1.35	—	0.21
Whole country	Whole area..	8.48	2.65	4.72	0.79

The table shows, as was of course to be expected, how enormously less cultivation there is in East Carelia than in Finland, especially when the ploughed area is compared with the total area of the provinces. Cultivation is by no means widespread in Finland, but whether the tilled land is compared with the total owned by the tillers or with the whole land area of the province, Olonets and Petrosavodsk have their place between the two least cultivated provinces of Finland, namely Kuopio and Uleåborg, while cultivation in Povenets is far lower even than in these provinces, although Uleåborg includes the whole of Lapland, and vast state forests. Cultivation is certainly better in the south of the province of Povenets, on the shores of Lake Onega, but it is so much the poorer in the other parts, as we saw from table I.

If we regard the tilled land from the point of view of the tillers, i. e. consider how much arable land there is per homestead, we see again, and perhaps most clearly of all, how very little tillage there is in East Carelia. Although the homesteads in the communities have an average of 57.5 hectares in Olonets, 71.7 in Petrosavodsk and 144.2 in Povenets, the average amount of tilled land per homestead is in Olonets only 1.94 hectares, in Petrosavodsk 2.31 and in Povenets 1.93. The amount of cultivation per homestead is also rather greater in the south-east of these provinces, but in the north of Olonets and in Povenets it goes down to about one hectare, and in Tulemajärvi (in Olonets) it is only 0.93 hectares. We return to these conditions after our account of agriculture in Kem Carelia.

Natural meadow is two to three times as extensive as arable land, or in Olonets 3.61 hectares per farm, in Petrosavodsk 5.93 and in Povenets 4.40. These meadows are often at a very considerable distance from the homesteads. The rotation is from of old in three shifts; the first year rye, the second oats or barley, and the third fallow. The fields are mostly unditched, and very poorly manured. The implements used are the forked plough and harrow of brushwood (Fig. 43) which were in olden times general in Finland, and are still in use in the more remote parts of Finnish Carelia. The women take part in outdoor work.

Although burn-beating has almost entirely died out in the province of Kem, further to the north, since the state has managed to suppress it on its own land, and the peasant communities there own so very little, this mode of cultivation is still in regular use in the three provinces now under consideration, and every homestead has an area where it may burn-beat (Fig. 44). The period between the burnings is very short, usually between six and twelve years, which is a sign of fertile land. It is possible to travel long distances through the bush-grown burn-beaten regions without coming upon real forest. The area burnt each year is given as 1.30 hectares per homestead in Olonets, 0.55 in Petrosavodsk, and 0.60 in Povenets, but what is called »wooded pasture» is sometimes included in this calculation.

Table II. gives the figures of *sowing* and *harvest*. The sowing and hay-harvest are taken from the statistics furnished by the zemstvo of the government. The grain harvest on the other hand, is estimated (in default of any better method) by adjusted calculations from the amount of corn sown, by agricultural experts who have travelled in the region in question and studied agricultural conditions there. These adjusted figures are rather too high than too low. As the quantities sown and harvested are in Finland generally given in hectolitres, the data which were originally given in poods are here reduced

Sowing and Harvest in the Provinces of Olonets,

Province and Commune	Number of Homesteads	S o w n					
		Autumn rye	Oats	Barley	Wheat	Summer rye	Peas
H e c							
<i>Province of Olonets:</i>							
Tulemajärvi	593	873	2,386	251	0.2	2	
Vieljärvi	987	2,185	6,644	420			0.6
Videle	1,027	1,835	4,395	340			
Kotkatjärvi	614	1,814	2,934	251	0.2		0.6
Riiipuskala	1,300	2,785	6,585	361			
Vaasheni	1,083	1,615	3,766	455	0.2		2
Njekkula	1,269	2,641	6,127	290	0.4		2
Mätysova	928	1,090	2,519	298	0.3	3	51
Total	7,800	14,838	35,356	2,666	1.8	5	56.2
<i>Province of Petrosavodsk:</i>							
Munjärvi	1,026	1,662	3,928	588	0.2		0.2
Kontupohja	1,295	1,928	5,113	619			0.2
Suurlahti	1,630	3,551	9,080	436	0.2		100
Tulvoja	1,721	4,049	11,529	774		4	31
Säämäjärvi	1,279	2,079	5,637	489			0.4
Suoju	1,286	2,032	5,421	570			
Pyhäjärvi	638	1,197	3,316	448			
Ladva	1,177	1,204	3,483	318	1		0.4
Soutjärvi	1,638	2,296	5,960	456	0.2		0.9
Ostreshini	614	621	1,721	107			5
Total	12,304	20,619	55,188	4,805	1.6	4	138.1
<i>Province of Povenets:</i>							
Rukajärvi	368	246	242	469		0.2	
Repola	261	256	48	300		0.9	
Porajärvi	357	426	242	338	0.4		2
Paadene	650	787	106	648	0.4		0.9
Petrovsko-Jam	451	311	343	434			
Mäntyselkä	647	871	1,552	558			0.2
Sunku	1,224	2,256	6,423	634	0.4	11	0.2
Danilova	309	348	290	246			0.2
Rinskaja	150	237	830	77			0.6
Total	4,417	5,738	10,076	3,704	1.2	12.1	4.1
Whole area	24,521	41,195	100,620	11,175	4.1	21.1	198.4

L E II.

Petrosavodsk and Povenets in the year 1902.

			Harvested						
Potatoes	Flax	Hemp	Rye	Oats	Barley	Wheat	Potatoes	Hay	
t o l i t r e s								kg.	
696	20	49	4,375	9,544	1,004	1	3,480	1,860,244	
921	87	159	10,925	26,576	1,680		4,605	6,622,386	
1,483	52	49	9,175	17,580	1,360		7,415	5,375,588	
842	242	49	9,070	11,736	1,004	1	4,210	3,146,696	
1,935	79	2	13,925	26,340	1,444		9,675	7,262,237	
1,653	73	25	8,075	15,064	1,820	1	8,265	4,186,908	
2,013	107	0.8	13,205	24,508	1,160	2	10,065	5,849,478	
1,354	58	1	5,465	10,076	1,192	1.5	6,770	2,868,728	
10,897	718	334.8	74,215	141,424	10,664	6.5	54,485	36,172,265	
1,404	73	73	8,310	11,784	2,352	1	7,020	5,073,181	
1,686	86	46	9,640	15,339	2,476		8,430	6,333,049	
1,704	108	7	17,765	27,240	1,744	1	8,520	11,426,098	
1,916	184	92	20,265	34,587	3,096		9,575	13,097,333	
1,533	131	209	10,395	16,911	1,956		7,665	9,776,501	
1,974	89	6	10,160	16,263	2,280		9,870	8,281,089	
918	59	37	5,985	9,948	1,792		4,590	5,026,383	
1,783	59	6	6,020	10,449	1,272	5	8,915	6,520,174	
2,907	110	4	11,480	17,880	1,824	1	14,535	7,699,829	
759	66		3,105	5,163	428		3,795	2,461,062	
16,583	965	480	103,115	165,564	19,220	8	82,915	75,694,699	
381	0.5	10	1,231	484	1,407		1,524	1,788,254	
366	1	48	1,285	96	900		1,464	1,429,253	
393	9	83	2,130	484	1,014	2	1,572	1,778,246	
495	13	82	3,935	212	1,944	2	1,980	2,500,620	
708		8	2,555	686	1,302		2,832	2,291,628	
776	34	115	4,355	3,104	1,674		3,104	3,694,656	
1,908	75	22	11,335	12,846	1,902	2	7,632	6,918,240	
324	4	9	1,740	580	738		1,296	1,808,532	
134	12	2	1,185	1,660	231		536	992,284	
5,485	148.5	379	28,751	20,152	11,112	6	21,940	23,201,713	
32,965	1,831.5	1,193.8	206,081	327,140	40,996	20.5	159,340	135,068,677	

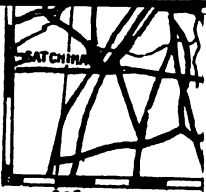
to hectolitres at the rate usually used in Finland, by which a hectolitre of wheat or rye is taken to weigh 70 kilogrammes, oats 40, barley 60 and potatoes 70. The amount of the harvest is shown graphically in map II. The totals from the different provinces are summed up in the following table.

The harvest of 1902 in hectolitres, hay in kilogrammes.

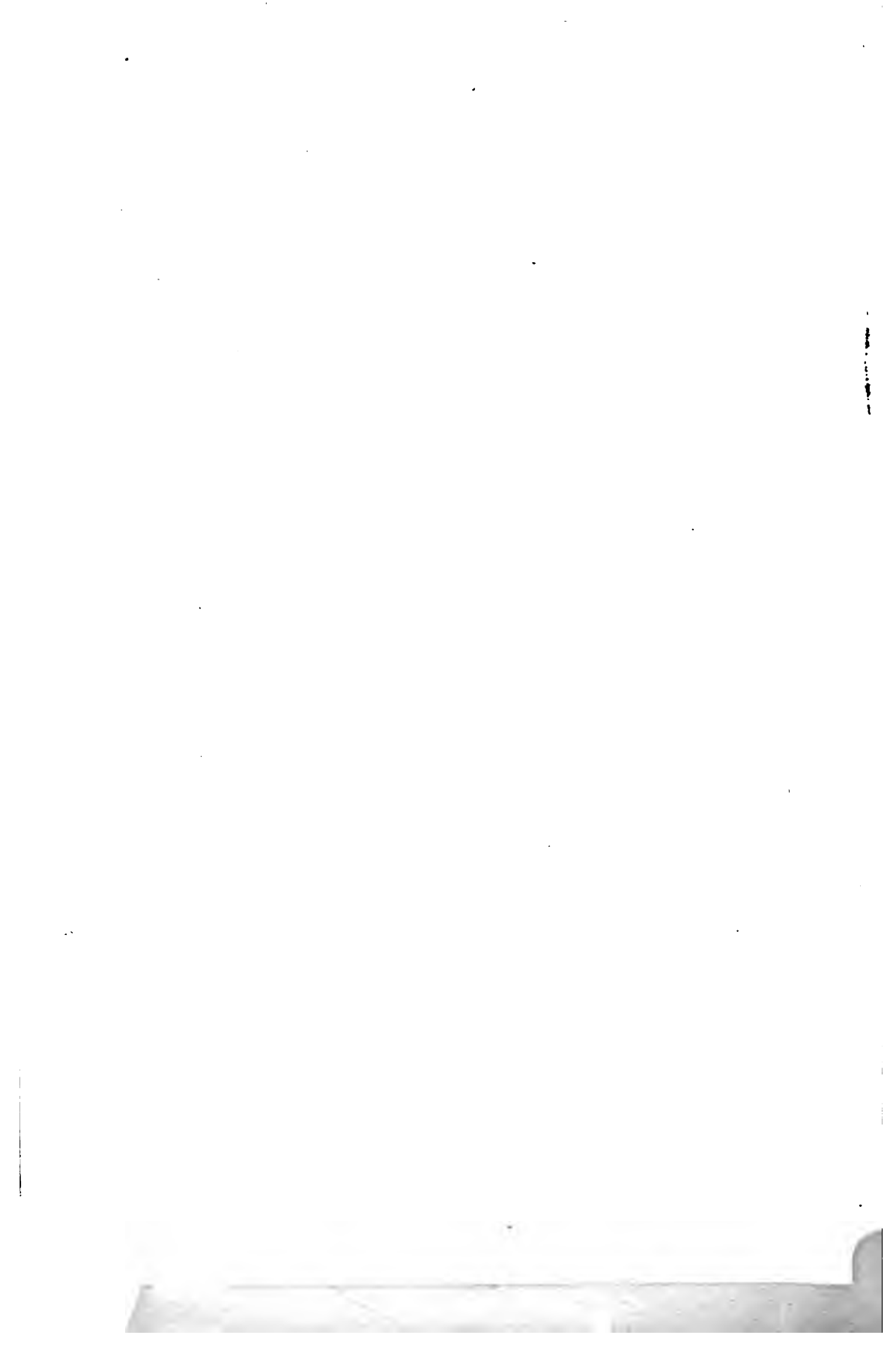
Province	Wheat	Rye	Oats	Barley	Potatoes	Hay, in kg.
Olonets.....	6.5	74,515	141,424	10,664	54,485	36,172,265
Petrosavodsk	8.0	103,115	165,564	19,220	82,915	75,694,699
Povenets....	6.0	28,751	20,152	11,112	21,940	23,201,713
Whole area..	20.5	206,081	327,140	40,996	159,340	135,068,677

The wheat harvest is obviously too small to have any practical significance. We have however included the figures, because in what follows a comparison is made between East Carelia and Finland with regard to the consumption of grain, and these figures will then be needed for the sake of completeness. For this comparison, however, we also need to know the amount of the harvest per head, and we therefore pass at once to that calculation.

The population of the rural communes in the year 1902 has been obtained from the enquiry made by the zemstvo of the government, and shown in Table I. above. The figures were obtained as follows; the corresponding figures were taken from the census of 1897, and to them were added the figures of the increase of the settled population for each subsequent year, these last figures having been obtained by the zemstvo through the chairmen of each commune. It should be mentioned that it is possible that the industrial population may have increased without the increase being adequately noted in the lists which were used as sources of information. This population is, however, only a small fraction of the whole, but the resulting figures for the year 1902 may for this reason be somewhat too low. We estimate the population of the towns as at the mean between the results shown by the censuses of 1897 and 1907. If we round off the figures thus obtained at the whole thousand next above, we obtain the following population for the year 1902; 43,000 in the province of Olonets, 90,000 in Petrosavodsk and 29,000 in Povenets. These figures are sufficiently exact for our purpose. The quantities of corn consumed per head in Finland which we give for the sake of comparison are taken from the Statistical Yearbook of Finland. The quantity of corn annually available for consumption is taken as being the harvest plus



30°



the amount imported, and minus the amount used for seed-corn, distilleries and export. The consumption per head has been obtained by dividing this quantity by the number of inhabitants. The result is, as usual, given in kilogrammes, which we also naturally adopt as the unit. The result is as shown below;

Harvest of 1902 shown in kilogrammes per inhabitant.

Province	Number of inhabitants	Wheat	Rye	Oats	Barley	Potatoes	Hay
Olonets.....	43 000	0.015	129.4	131.5	14.9	88.7	841.2
Petrosavodsk	90,000	0.006	85.9	73.6	12.8	64.5	841.1
Povenets....	29,000	0.014	74.4	27.8	23.0	52.9	800.1
Whole area..	162,000	0.009	95.4	80.2	15.2	68.9	833.8

Consumption in Finland per inhabitant in the years 1896—1910, expressed in kilogrammes.

Year	Number of inhabitants	Wheat	Rye	Oats	Barley	Potatoes and other roots	Hay
1896—1905	2,710,496	37.3	200.8	87.8	36.9	152.2	about
1906—1910	2,997,740	51.2	183.7	97.7	34.0	179.9	700

These tables show that if the harvest of the East Carelian provinces be compared with the natural rate of consumption, it does not suffice to cover the needs of the country itself. We are now specially referring to the comparison between the harvest and the consumption of rye and wheat. If the amount requisite for seed corn be subtracted, there remains from the harvest of the Carelian provinces only about 80 kilogrammes per inhabitant, while in Finland the consumption of these grains is between 230 and 240 kilogrammes per head annually. The similarity of climate, country and race between Finland and East Carelia obliges one to picture the consumption of corn per individual in the two countries as somewhat the same, or at least as tending towards similarity. It may certainly be argued that in Finland a fairly large quantity of rye is used as strong food for horses and cows, but the number of cows, and especially of horses per inhabitant is considerably larger in the three East Carelian provinces than it is in Finland — as will be shown presently, and as is also comprehensible, as almost the whole population there is engaged in agriculture and goods must for the most part be conveyed by

horse. Moreover, the hay harvest is in proportion to the number of beasts smaller rather than larger in Finland, so that this argument does not improve the deficiency of grain in East Carelia as compared with Finland. As shown in our chapter on East Carelian trade, grain is also the chief article of import for the whole territory. Nevertheless, in certain districts, as on the peninsulas which jut out into Lake Onega and some other limited regions in the south, and even in certain villages and homesteads in the province of Povenets, the harvest suffices for home needs, and sometimes for sale as well. There is even a regular export of oats to Petersburg from the province of Olonets, where the oats crop is strikingly large. On the other hand, rye and wheat are imported even here, the latter being partly used for making the small ring-shaped water biscuits which form a widespread home industry, and are also well-known in country places in Finland.

The rye imported into these three provinces forms two-thirds of their total imports. The grain is imported in the summer along the water-courses from Rybinsk, Vologda and Saratoff. Unfortunately, the figures are not complete enough to afford certain information as to the quantity imported into the territory in question, and still less as to the quantities imported into each province. We may perhaps suppose that out of the $44\frac{1}{2}$ million kilogrammes of rye and wheat landed on the piers in the Svir according to the figures for 1900 (see the chapter on Trade and Industry), some twenty million kilogrammes came to the three provinces here in question. This is fairly probable, seeing that more grain is produced in the regions south of the Svir than in those to the north of that river. If we add to this the quantities imported via Petrosavodsk and Povenets, we should reach a total import of more than 30 million kilogrammes, or about 190 kilogrammes per head. It may be, however, that this figure is too high, as the home crop produces for consumption about 80 kilogrammes per head, although it must also be remembered that some portion of this grain is transported further north from Povenets to the province of Kem. On the other hand, some grain is imported from Finland into the north-western regions of Povenets (Repola and Porajärvi) in exchange for fish and birds.

Cattle rearing is, like agriculture, at a very low level of development. Table III. shows the number of domestic animals. By adding up the figures for the separate provinces, we obtain the following three tables, which show the *number of domestic animals in the provinces*, the *number per homestead* and the *number per individual*. The last table gives also the figures for Finland, for the sake of comparison: It may further be mentioned that foals, lambs and young pigs are not included in any of these tables.



Fig. 43. Girl Driving a Harrow of Brushwood, Village of Jyrkänmäki. Province of Povenets.

Photo P. Eskola.



Fig. 44. Burn-beaten Field, with Crop of Oats. Village of Kolat-selkä. Tulemajärvi, Province of Olonets.

Photo P. Eskola.



Fig. 45. Cows of East Carelian Breed, Province of Olonets.

Photo A. Hagman.



Fig. 46. Agricultural Expert on an Official Journey, Village of Kumsujärvi, Mantyselkä, Province of Povenets.

Photo A. Hagman.

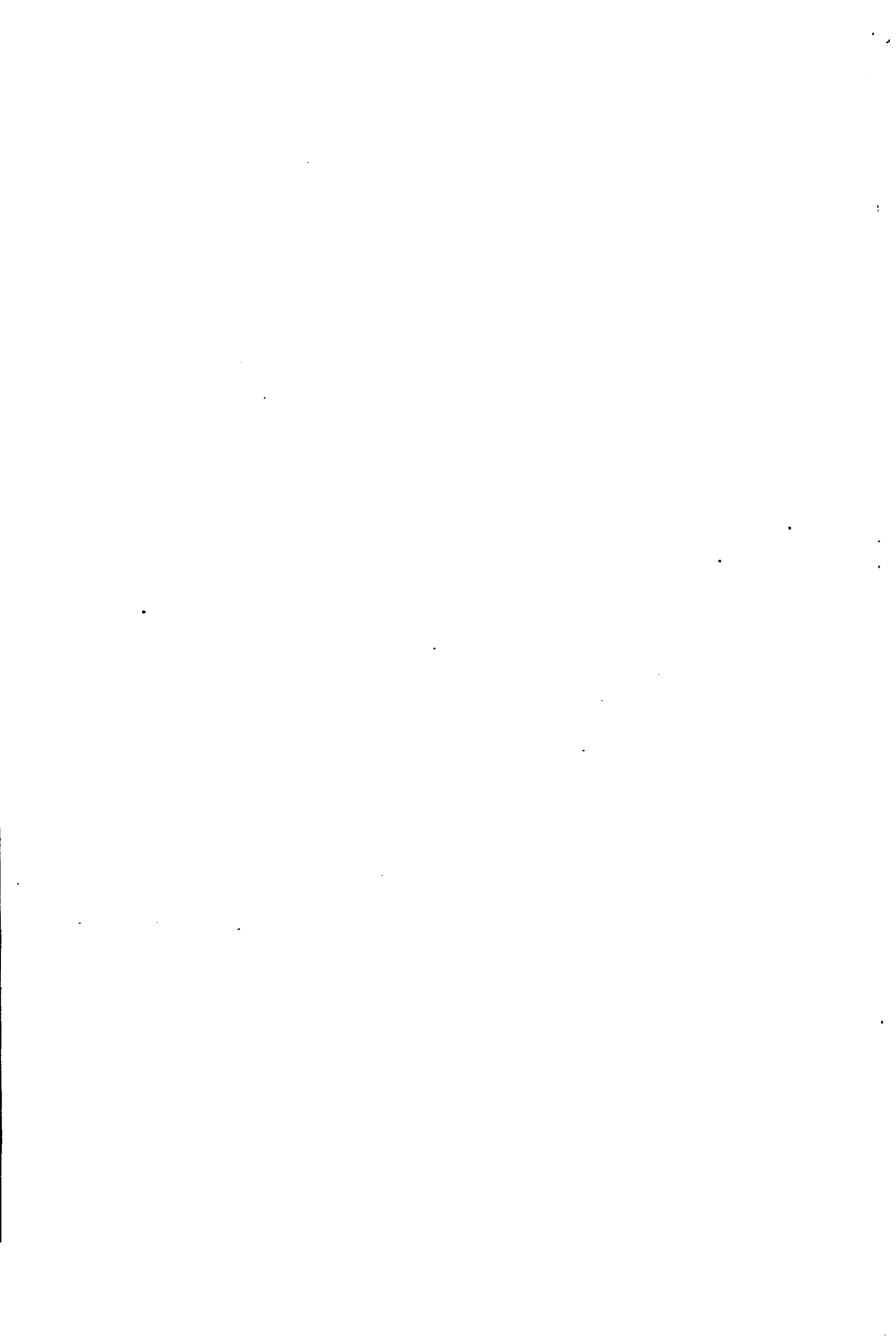


TABLE III.

Number of Domestic Animals Kept by the Rural Population of the Provinces of Olonets, Petrosavodsk and Povenets in the year 1902.

Province and Commune	Number of Homesteads	Horses		Cattle		Sheep	Pigs
		Cart horses	Driving horses	Milch cows	Other cattle		
<i>Province of Olonets:</i>							
Tulemajärvi.....	593	486	60	1,253	1,088	1,674	365
Vieljärvi	987	1,105	407	2,641	3,032	5,640	431
Videle.....	1,027	1,014	268	2,311	2,398	2,731	768
Kotkatjärvi	614	681	280	1,692	2,041	2,248	268
Riipuskala	1,300	1,246	543	2,288	2,898	3,055	1,013
Vaasheni	1,083	827	171	2,120	2,104	1,219	437
Njekkula	1,268	1,012	304	2,112	2,204	2,500	767
Mätisova	928	633	94	1,486	1,641	923	—
Total	7,800	6,986	2,127	15,903	17,399	19,900	4,048
<i>Province of Petrosavodsk:</i>							
Munjärvi	1,026	994	854	2,083	2,161	3,516	—
Kontupohja	1,296	1,152	325	2,672	2,492	3,870	—
Suurlahti	1,630	1,699	596	3,997	4,148	4,520	5
Tulvoja	1,721	2,171	1,006	4,179	4,928	7,146	2
Säämäjärvi	1,279	1,335	349	3,098	3,143	4,724	525
Suoju	1,286	1,303	326	2,696	1,969	3,468	6
Pyhäjärvi	638	665	192	1,572	1,545	2,623	274
Ladva	1,177	843	86	2,250	1,788	1,715	4
Soutjärvi	1,638	1,229	143	3,131	3,281	2,595	25
Ostretshini	614	497	42	1,122	1,045	520	1
Total	12,304	11,888	3,419	26,799	26,500	34,697	842
<i>Province of Povenets:</i>							
Rukajärvi.....	368	298	35	676	622	1,004	—
Repola	261	216	11	696	578	1,152	—
Porajärvi	357	330	62	804	766	1,379	—
Paadene	650	649	93	1,418	1,125	1,808	3
Petrovsko-Jam	451	433	99	689	675	1,318	5
Mäntyselkä	647	566	133	1,312	1,085	1,932	14
Sunku	1,224	1,148	341	2,251	2,466	3,271	1
Danilova	309	323	74	470	470	871	—
Rimskaja	150	133	27	311	392	603	—
Total	4,417	4,096	875	8,627	8,179	13,338	23
Whole area	24,521	22,970	6,421	51,329	52,078	67,935	4,913

Number of Domestic Animals in the year 1902.

Province	Number of home-steads	Horses	Horned Cattle			Sheep	Pigs
			Milch cows	Bulls and young cattle	Total		
Olonets.....	7,800	9,113	15,903	17,399	33,302	19,900	4,048
Petrosavodsk	12,304	15,307	26,799	26,500	53,299	34,697	842
Povenets....	4,417	4,971	8,627	8,179	16,806	13,338	23
Whole area..	24,521	29,391	51,329	52,078	103,407	67,935	4,913

Number of Domestic Animals per Homestead.

Province	Number of home-steads	Horses	Horned Cattle			Sheep	Pigs
			Milch cows	Bulls and young cattle	Total		
Olonets.....	7,800	1.168	2.036	2.231	4.270	2.551	0.519
Petrosavodsk	12,304	1.244	2.178	2.154	4.332	2.820	0.068
Povenets....	4,417	1.125	1.953	1.882	3.835	3.020	0.005
Whole area..	24,521	1.199	2.063	2.124	4.217	2.771	0.200

Number of Domestic Animals per 1,000 Inhabitants in East Carelia in 1902 and in Finland in 1900 and 1910.

Area	Number of Inhabitants	Horses	Horned cattle			Sheep	Pigs
			Milch cows	Bulls and young cattle	Total		
Province of Olonets	43,000	212	370	405	775	463	94.1
» » Petrosav.	90,000	170	298	294	592	386	9.4
» » Povenets	29,000	171	297	286	580	460	0.8
Whole area	162,000	181	317	321	638	419	30.3
Finland in 1900	2,783,665	102	395	131	526	363	76.0
» » 1910	3,115,197	97	374	141	515	253	50.4

The middle table shows that in all three provinces there are rather more than one horse and about two milch cows per homestead, that the number of sheep varies from 2.5 in Olonets to 3 in Povenets, while pigs are only reared to any great extent in Olonets (0.5 per homestead), to a small extent also in Petrosavodsk, but in Povenets practically not at all.

If, again, we compare the *number of domestic animals per inhabitant*, as shown in the last table, we find that in the East Carelian provinces there are 181 horses per 1,000 inhabitants (212 in Olonets), while the corresponding number for Finland is about 100. The total numbers of horned cattle (including young beasts) rises from 580 per 1,000 inhabitants in Povenets to 775 in Olonets, while in Finland it is about 520. The number of «milking cows» in the East Carelian provinces is, however, considerably less than that of «cows over three years» in Finland, given in the same column. The number of dry cows in Carelia is also proportionately very large. As the winter fodder is very poor, the cows begin to go dry as early as October, up to which time they are out at pasture. (See GÖSTA GROTFELT; »Vanhanakainen suomalainen maitotalous», pages 229—242. We shall also refer to this valuable work in many other paragraphs dealing with dairy economy.) The number of sheep in Carelia is about 420 per 1,000 inhabitants but is diminishing in Finland, being 521 in 1870, 363 in 1900 and 253 in 1910. The number of pigs is fairly large, 94 per 1,000 inhabitants in Olonets, in Petrosavodsk 9.4, but in Povenets only 0.8. In Finland the number of full-grown pigs (over eight months) in September 1910 was given as 50 per 1,000 inhabitants. The figures for 1900 apply to the end of the year, after the pig-killing, and undoubtedly include young animals.

Finally we compare the hay crop with the number of animals, and, as usual here in Finland, we reckon one horse as equivalent to two full grown head of cattle, one head of cattle equal to two foals, heifers or calves, or eight sheep and three pigs. Foals are now included, as is customary, and we assume that in the Carelian provinces they number one tenth of the number of full-grown horses, since the proportion here in Finland is one-seventh, and full-grown horses are imported into Carelia. We thus obtain the following figures;

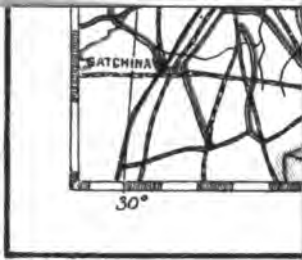
The Hay Crop in 1902, reduced to kilogrammes per head of cattle.

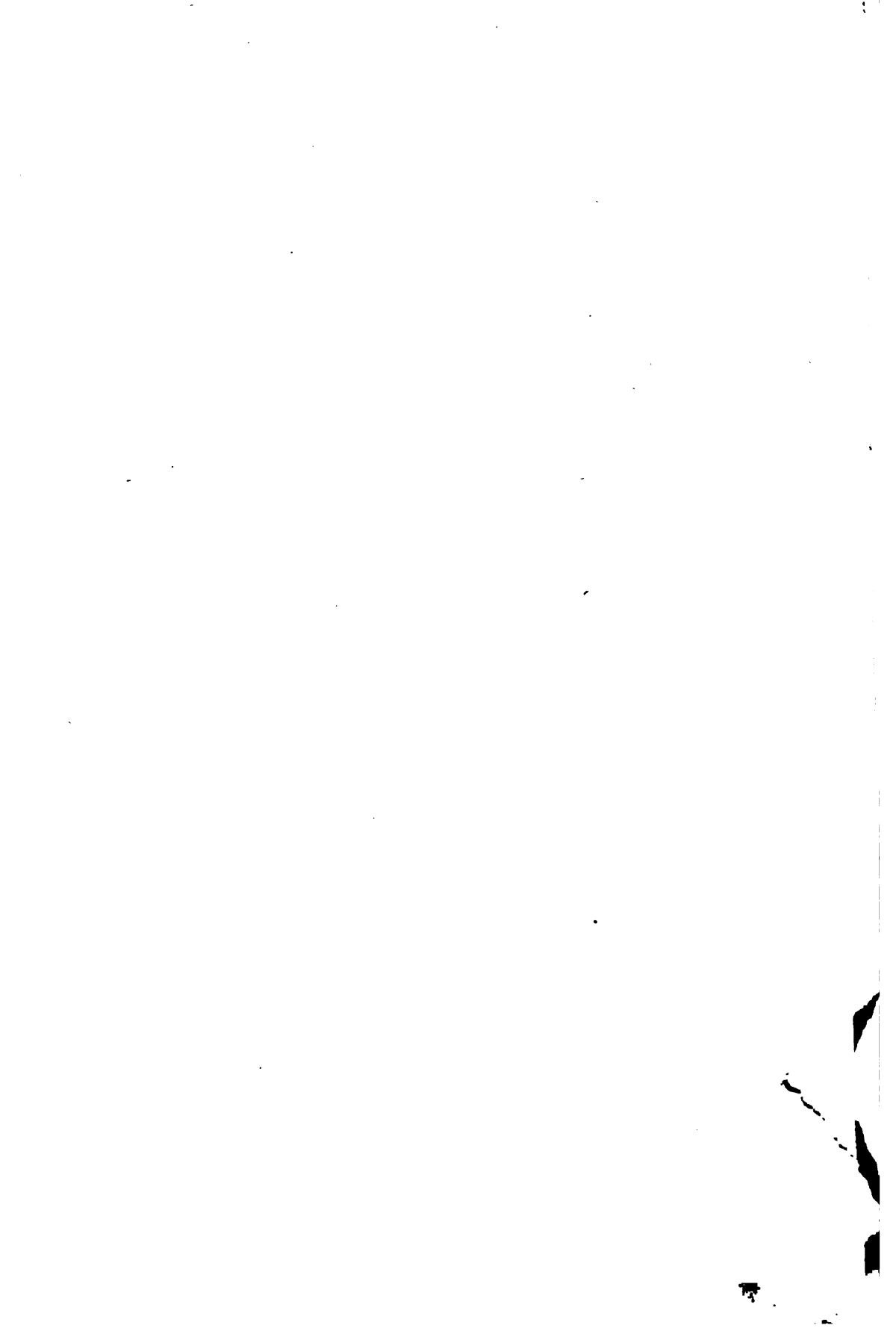
Area	Hay Crop	Number of cattle (calculated as above)	Amount of hay per head of cattle
Province of Olonets.....	36,172,265	47,890	755.32
» » Petrosavodsk	75,694,699	81,371	930.24
» » Povenets	23,201,713	24,929	928.37
Whole area	135,068,677	154,253	875.63
Finland, 1910	1,936,878,900	2,185,757	886.14
Average 1908—1912	2,021,444,500	2,160,000	935.85

Unless the hay crop of the East Carelian territory is estimated rather too high, we find that it comes to about the same equivalent amount per head of cattle as in Finland. In both countries this quantity is far below the requirements and strong foods have to be used. This has also its advantages, but easily leads to the maintenance of too large a stock of beasts, still further diminishing the supply of grain for human food, which is already all too small. As, moreover, the situation of East Carelia between Lake Onega and Kandalaks is somewhat more northerly than that of the portion of Finland suited to agriculture, between the Gulf of Finland and, let us say, Tornea, the period of winter feeding is rather longer in East Carelia than it is here. From what we have been able to learn of the care of beasts while they are in stable and byre in East Carelia, their food during the winter is in general all too scanty, and they have to be content with what there is. Under these conditions, the produce is naturally small, and there can generally be no question of a surplus of milk for sale or export. There is often great shortage of milk and butter in the household, although the Carelians are fond of feasting on butter and pastry and other fat dainties when such are obtainable, between their numerous fasts. It may be added that the cattle are often decimated by severe epidemics, and also that the bear likewise exacts his annual tribute, especially in the province of Povenets.

So far we have only spoken of the hay crop and the scanty fodder afforded to the cattle. The dairy economy and butter making are also at a primitive level (cp. Grotenfelt, loc. cit.), similar to that in the more remote districts of Finland before dairy farming made its entrance here and all attention was concentrated on cattle breeding and butter production. We will only add with regard to East Carelia, that, with the spread of enlightenment and the improvement of communications and the conditions of land ownership, there may be a very splendid future in store for both agriculture and cattle breeding, when once the magnificent natural meadows have been brought under tillage and bog cultivation has been set on foot.

Gardening has made some way in the southernmost part of the territory and on the fertile peninsulas in Lake Onega, as well as to the west of that lake. It could probably be developed to a fairly high point.





The *forest lands* belonging to the village communities are fairly extensive, and their area is shown in the following table;

Province	Hectares	Hectares per village community	Hectares per homestead
Olonets	274,966	2,132	35.25
Petrosavodsk.....	464,736	3,575	37.77
Povenets.....	329,679	1,821	74.64
Whole area	1,069,381	2 487	43.61

The rights of utilising the forests are, however, strictly limited, both for communities and for separate homesteads, through various state regulations. Homesteads may take a certain number of trunks annually, as a rule only six, for indispensable requirements, as well as fuel, which latter may in certain cases also be taken from the state forests. After forest fires also, the peasants have often been allowed to use timber that has been injured, even in the state forests, a circumstance which has probably not diminished the frequency of forest fires or increased the zeal displayed in extinguishing them. If a community wishes to sell any of its timber, the state acts as intermediary, and receives the payment, under the obligation of using the money for necessary improvements to the village community, such as buildings, roads, etc.

Roads are, however, not abundant even in these southerly provinces, as appears from the following table, which shows that nearly half the villages in Olonets, and more than half the villages in Petrosavodsk and Povenets were in 1905 still without any roads practicable for wheeled traffic.

Number of villages situated on public high roads, on village roads or on no road at all.

Province	Number of villages	on public high roads	on village roads	without road
Olonets	534	38	206	229
Petrosavodsk	636	23	243	371
Povenets	402	26	123	253
Whole area .	1,572	87	572	853

The distance from the roadless villages to the nearest practicable road was in bad cases several tens of versts, in Olonets between 30 and 40 versts, and in Petrosavodsk between 40 and 50, while in Povenets there were fourteen villages situated more than 50 versts from the nearest road. For this reason travellers often go on horseback, while goods are conveyed by sledge even in the summer. (See figs. 46, 47 and 48).

It is easy to understand that the lack of roads puts great difficulties in the way of agricultural progress.

A few words may be added about the *agricultural population* itself. The Carelians inhabited of old a territory which stretched far to the east and south of all the present Carelian country. During the time of Novgorod's greatness, however, the Russians penetrated the Carelian territory, and this continued during the time of the Muscovite monarchs. These latter favored immigrant »White Russians» and gave them large tracts of land for their own, which land, however, is now held in the same way as that of other peasants. Some of them penetrated as far as the Petrosavodsk region, where thirty-seven villages are inhabited by their descendants, who are still called »White Russians». The ironworks established by Peter the Great brought other Russians — these from the black soil country — to the same districts, and some of these were also agriculturalists. The statistics therefore divide the cultivators in the present village communities into four categories; »former state peasants», which include all the peasants in the provinces of Olonets and Povenets, except for one village, »former estate owners' peasants» (six villages in the province of Petrosavodsk), »former works' peasants» (two villages in Petrosavodsk), and »white peasants» (thirty-seven villages in Petrosavodsk and one in Povenets). The so-called »state peasants» were of old comparatively free, and even now still own more land than the estate-owners' or works' peasants. We cannot here go into these questions in detail, but it seems well to give some facts with regard to the social position of the inhabitants at different times. (See for example AXEL LILJESTRAND, »Kulturkampen i Bjarmaland», 1891, and E. AHTIA'S historical presentation in »Karjalan kirja», 1910).

Up to the time of Peter the Great the peasants enjoyed complete personal liberty. They had to pay tribute to the crown and the church, but they owned their land, which descended from father to son, and could freely buy and sell it. In 1701 and the following years, Peter established copper and iron smelting works and cannon and other factories on the site where the town of Petrosavodsk grew up at the same time, at Kentjärvi and in the province of Povenets. Hands were needed for all these works, and the native male popu-

lation was commanded either to enter the actual works, or to hew wood, burn charcoal, dig ore and transport it to the smelting works. By the end of Peter's reign this staff of native workmen numbered between fifteen and sixteen thousand, and formed practically the whole of the adult male population, which had at that time been severely decimated by the wars. Thus the population came into a kind of practical thralldom. The wage was only four kopeks per day in winter and five in summer, six to ten kopeks for a day's work with a horse, and this was naturally not enough to support the family. The result was very great discontent, which later broke out in serious disturbances. This compulsory labour continued after the time of Peter, and was used, for example, in quarrying the marble from Tiudie for building the church of St. Isaac in Petersburg. Shortly before 1770 the number of workmen reached about 19,000. The disturbances got more and more violent, and in 1769, when the factory work was forced on even at the busiest summer season, developed into a great revolt, which, however, was finally quelled in 1771, terribly severe punishments being then inflicted. After this, greater calm prevailed and the public works were somewhat diminished.

By the *land reforms* carried out under the empresses Elisabeth and Catherine (decrees of 1766, 1768, 1781 and 1785), all the peasants' land was declared to belong to the state and appropriated thereby, while certain areas round the villages were assigned for the use of the peasants, each male individual being granted for cultivation an equal area of the common land of the village community. In the provinces of Petrosavodsk and Povenets, however, this reform was not completely carried out until after the middle of the last century, when the institution of the mir, as described above, was there finally organised. It is very desirable that a detailed investigation should be made into the former social and economic conditions of East Carelia.

There is not much to be said about agriculture in KEM CARELIA, in view of the exceedingly small area of land owned by the peasants and the primitive nature of the cultivation. The statistics with regard to agriculture are also somewhat scanty and uncertain. Though the zemstvo of the government of Archangel has collected admirable data and descriptions of the eastern parts of the government, which are situated nearer to its capital, it has rather scanty information about the province of Kem, which lies west of the White Sea and has a population which is foreign to the Russians.

A few words may here be devoted to the progress of social conditions in

the province of Kem, as a supplement to what has been said above as to the corresponding conditions in the three southern provinces.

In the course of the continual plundering expeditions or so-called «robber wars» of the fourteenth, fifteenth, sixteenth, and the beginning of the seventeenth centuries, which were waged between Sweden and Russia, — i. e. between the Finns east and west of the political frontier, — the country each side of this frontier, lying between the Gulf of Bothnia and the White Sea, was as a rule severely harried. After the Peace of Stolbova (1617) these regions were left to some extent in peace, and flikey during the following war between Sweden and Russia. Kem Carelia was also to some extent spared during the «Great War», and the later wars of the eighteenth century, except for the severe plundering by the Russian soldiers quartered there during the war of 1788—90. On the other hand, from the middle of the seventeenth century this country was severely shaken by religious quarrels and the persecution of the Old Believers, dissensions which continued for a century and more, even down to our own days. When the patriarch Nikon carried out his «reformation» or revision of the church books about 1650, the powerful monastery of Solovets joined his opponents, the Old Believers (raskolniki). After several fruitless expeditions and sieges, the monastery was taken by the government troops in 1676. The monks who escaped death or imprisonment, however, spread the opposition to the regions south and west of the White Sea, and it is marvellous to read how steadfastly and heroically these Carelians in masses suffered death in the flames, and in this «baptism of fire» gave their lives for their faith. These Old Believers are still in our own days unshakeably devoted to their religious confession. These deeds of martyrdom reveal a seriousness and strength of character which is somewhat unexpected when the light and playful temperament of the Carelians is so often described.

One result of the Solovets monastery's revolt against the new, orthodox doctrine, was that the wide lands which had been bequeathed to it on the mainland to the west, where the peasants were regarded as serfs of the monastery, were confiscated by the state. The lands were, however, restored after the taking of the monastery, when the new monks acknowledged the established, new orthodox doctrine. After changing fortunes during the time of Peter I., and a restoration to the monastery in 1711, these domains with their 5180 peasants were finally appropriated by the state in 1764, and, together with the rest of the territory between the White Sea and the political frontier, were incorporated with the province of Onega. In the year 1785 Kem was granted municipal rights and in 1787 it was made the capital of a



Fig. 47. Bridge in Kem Carelia. Guests returning from a party.
Photo J. K. Inha.

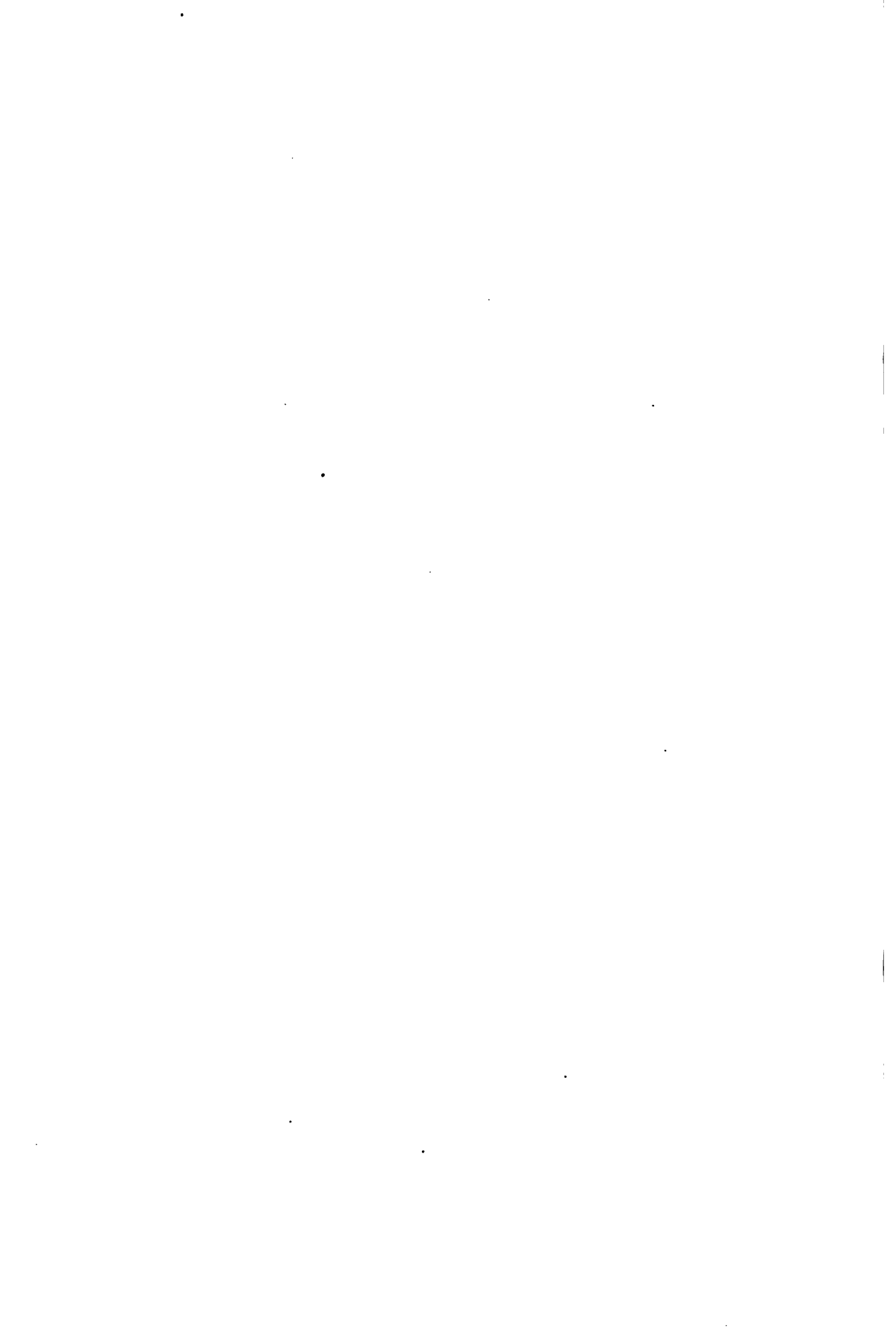




Fig. 48. Road in Kem Carelia.

Photo *I. K. Inha.*





territory called the »Province of Kem», the boundaries of which, however, were frequently altered. In that year the province was assigned to the government of Olonets, but in 1802 it was transferred to the government of Archangel.

The following quotation from E. Ahtia (loc. cit.) gives, in all its shortness, a very telling picture of the condition of the peasants under all these phases, in the territory which now forms the province of Kem.

»The peasants here who were subject to monastery or the crown, were, even under that sway, in a much better position than those who groaned else where in serfdom under individual nobles. Life was fairly free in these distant wilds. One could burn-beat where one pleased and set snares for birds without any interference. Provided one could survive the years of bad harvest, was obedient to the church, paid one's dues and did not evade military service (which lasted nearly a lifetime), one might act pretty much as one pleased. Not till the time of Catherine II. did a burdensome policy of restriction begin to be applied even here. In the year 1765 it was enacted that here, as elsewhere, all land which did not belong to nobles, was the property of the state. A decree of 1784 declared that all the land in a village needed for cultivation was the common property of the village community. But in spite of all decrees and orders, the previous system of private ownership continued to a considerable extent far into the nineteenth century. In 1829, however, a general division of the land took place; in the middle of the same century all burn-beating was forbidden, and the peasant had to limit his cultivation to the patch of ground which he could manage to till with the help of the few beasts he might chance to possess.»

The population suffered enormously and was severely decimated by the famine years in the middle of the century, and especially 1867 and 1868. A perceptible improvement was brought about, however, by the decree of March 13th, 1873, which gave the peasants the right to ground for reclamation on crown lands on a forty years' tenancy.

Strelbitski gives the *area* of the province of Kem, including inland waters and the islands in the archipelago, as 45,479 square kilometres. A glance at the map, however, shows that there is here some mistake, which has subsequently been adopted in print (cp. the chapter on the forests of East Carelia). Planimetric measurement on our maps gives the result as about 70,200 square kilometres. As only a few of the many islands in the archipelago are marked on the maps, the area cannot be calculated more exactly.- The *landarea*, ey-

cluding water, appears to be about, or perhaps rather more than, 62,500 square kilometres.

According to the great census of 1897, the *population* was then 35,392, and in 1907 it amounted to 42,242. The statistics of population vary considerably from year to year, which may be partly due to the fact that at certain seasons of the year thousands of persons are absent fishing either on the Murman Coast or on the White Sea. According to N. KNIPOVITCH (Russian Encyclopaedia, 1895), the population on January 1st, 1894, consisted of 36,589 persons, of whom 32,214 were peasants. According to the same source there were in 1890 293 villages, and 5,028 peasant homesteads (6,112 dwelling houses).

The conditions of *land ownership* are the same as in the southern provinces, i. e. the institution of the mir is in force here also, but the area belonging to the village communities is very small. According to Knipovitch it was in 1890 only 42,579 hectares, or 0.68 % of the total area of the province.

According to *Mamadysanski* (»Land Conditions in the Government of Archangel», records of the government of Archangel, 1908), the ownership of land in the province of Kem was in the year 1905 divided as follows:

The crown	4,901,783 hectares
Peasant communities	41,572 »
Solovets Monastery	29,150 »
The towns	20,535 »
The church	1,241 »
Factories and companies	33 »
<hr/>	
Total 4,994,314 hectares	

The crown lands have not been exactly surveyed, and obviously too small a figure is here given for them. If the other lands are rightly given, and we assume that the total land area is about 6,250,000 hectares, as suggested above, the crown lands would come to 6,157,469 hectares, the remaining lands all together coming to 92,531 hectares. If the figures are calculated as percentages of the total land area, we obtain the following results;

Crown lands	98.5195 %
Peasant communities	0.6651 »
Solovets Monastery	0.4664 »
The towns	0.3286 »
The church	0.0199 »
Factories and companies	0.0005 »

The *villages* are large, at least in the sense that they consist of a large number of homesteads. The average number was 17.2 according to Knipovitch in 1890, and 20.4 according to Mamadyshski in 1905. Several villages consist of over a hundred homesteads, and look like small towns, or perhaps more like extensive, though by no means modern, communities of small holders. The largest villages are well known far around, and form the centres of trade in these remote regions. This is also true of many of the large villages in the southern provinces, especially Povenets. The largest village in Kem Carelia is *Uhtua* (or Uhut), situated where the river of the same name runs into lake Keski-Kuittijärvi (Fig. 49). It contains about 300 homesteads, and is the centre of the trade and the awakening intellectual interests of northern Carelia. The largest and most important village in the north of the province of Povenets is *Repolu*, on Lake Lieksa in the commune of the same name. This village has from of old had trade relations with Finland. Koikari, on the river Sununjoki in the commune of Lindajärvi, is a rather handsome village in the same province (Fig. 50).

According to Knipovitch's figures there would be 8.47 hectares of the peasants', i. e. of the village communities' land to each homestead.

According to Mamadyshski, the number of homesteads was in 1905 rather larger, namely 5,982, which, taking his estimate of the extent of the communities' land, would give an average of 6.96 hectares per homestead. In addition to this, the state has assigned 6,671 hectares of land for reclamation on lease to 1,306 peasants, or an average of 5.11 hectares per peasant. Figures which I have seen give the rent as five roubles per dessiatin (= 1.0925 hectares) annually. Most of the tenants appear also to own shares in the land of the village communities.

It is a peculiarity of the province of Kem not found in other parts of the government of Archangel (and at that time, 1905, scarcely in any other territories either), that the community land (13,886 hectares) of nineteen villages had been definitively divided among the 1,408 homesteads they contained, each homestead in these villages thus receiving on an average 9.86 hectares.

The proportion of cultivated land is everywhere very small. Table IV. gives the statistics of sowing and harvest and the area sown in each commune, and according to these figures the area sown in that immense province was in 1905 only 4,332.9 hectares. If the cultivation in the towns of Kem and Suma (7.7 hectares) be subtracted, there remain 4,325.2 hectares, or an average of 0.72 hectares of sown land per homestead, on Mamadyshski's figure of 5,982 homesteads. As the small rye fields are left fallow every second or third year, the amount of land which is cultivated at all is rather larger, or about 0.9 hectares per

TABLE IV. *Sowing and Harvest in Kem Province of the Government of Archangel in the Year 1904.*

Commune	Population in 1907	Area sown in hectares	Quantity sown						Harvest				Hay, in kilogrammes	Harvest per Inhabitant																
			Rye	Barley	Oats	Pota- toes	Rye	Barley	Oats	Pota- toes	Barley	Oats		Pota- toes	Hay															
Town of Kem ..	2,870	2.2	—	—	—	42	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				
» » Suna..	1,427	5.5	—	—	—	164	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—			
<i>Rural Communes:</i>																														
Kandalaks	586	2.2	—	—	—	63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
Kouta	713	1.1	—	—	—	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Kieretti	1,089	45.9	2	315	—	42	8	945	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Onlanka	1,906	238.2	229	1,638	—	2,936	571	4,914	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Kestinki	3,586	524.4	420	2,100	—	2,121	1,690	5,250	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Vitsataipale	912	182.4	50	462	—	168	302	1,848	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Pistojarvi	1,318	269.8	130	781	—	792	651	2,344	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Vuokkiniemi	3,005	361.6	378	872	—	456	1,134	3,486	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Uhtua	3,005	695.9	160	941	—	372	622	3,142	25	1,487	2,734	2,817,360	24.13	59.34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Paanajarvi	1,066	143.1	8	315	—	273	105	1,575	—	1,365	3,423,420	15.52	62.75	0.33	34.64	1,139.24	89.63	568.54	—	—	—	—	—	—	—	—	—	—	—	
Ponkama	1,892	31.7	—	46	—	67	—	172	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Usmata	555	66.6	—	179	—	32	—	504	—	95	183,456	7.43	65.2	5.45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Kontokki	1,872	246.9	139	200	—	128	55.4	798	—	512	404,095	22.19	25.88	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Jyskyjarvi	1,734	292.8	88	298	—	277	441	1,193	11	1,386	409,500	19.07	41.28	0.25	55.96	236.16	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Jungut	2,286	533.1	273	294	—	294	546	630	735	1,050	1,392,300	17.91	16.63	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Vojjarvi	1,052	99.4	67	370	—	151	269	1,109	—	454	458,640	19.18	63.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Suiku	1,844	4.4	—	—	—	7.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Suikjarvi	1,075	209.8	244	336	—	164	487	736	113	567	1,277,640	33.98	41.02	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Sorsoka	3,406	4.4	—	—	—	2	—	—	—	8	270,270	—	1.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Lapina	1,171	181.4	132	183	—	80	263	315	323	735	704,340	13.41	12.65	8.78	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Koleshma	1,034	1.1	—	—	—	8	—	—	—	25	1,015,560	2.34	21.88	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Njuhsha	2,018	189.0	—	32	—	2	63	735	—	8	1,212,120	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
Whole area	41,722	4,332.2	2,352	9,710	—	327	8,849	7,696	29,756	1,207	36,905	19,094,494	13.66	42.57	1.14	61.15	452.08	—	—	—	—	—	—	—	—	—	—	—	—	

homestead. Formerly the cultivation of grain was to some extent supplemented by the prevailing practice of burn-beating in the crown forests, but since the state forestry has become more intensive and the supervision stricter, this practice has almost entirely ceased. The peasants are, however, allowed to take wood from the state forests in return for payment in kind, i. e. day-labour in cutting and carting timber.

The *harvest* of the province amounted in 1904 to

	7,696	hectolitres	rye,
	29,759	»	barley,
	1,207	»	oats,
	36,905	»	potatoes,
	19,094,494	kilogrammes	hay.

If the population of the province be estimated at 40,000 persons, this gives the following number of kilogrammes per person; — rye 14.43, barley 44.64, oats 1.21, potatoes 64.58, hay 477.76.

In this northern land the rye and still more the oat harvest is very small, but the barley crop on the other hand is comparatively large, considerably more than the crops of rye and oats together, and nearly three times as much per individual as the average of the three southern provinces. Table IV. shows, however, that rye still grows quite well in Kiestinki and Oulanka, that is, right up to the arctic circle. Oats grow very well in Tungut, in 64° 20' north latitude (somewhat north of Kajana in Finland), apparently better than rye or barley. The hay and potato crops are also comparatively abundant, the latter being almost as much per inhabitant as in the three southern provinces, less than in Olonets but as much as in Petrosavodsk and more than in Povenets.

Table IV. and the graphic representation on Map II. show also that the harvest, especially that of barley and potatoes, is strikingly good in certain districts of the extreme north of the province, such as Kiestinki and Oulanka, whether reckoned absolutely or per inhabitant. So too, in the small northerly communes of Vitsataipale and Pistojärvi the barley crop (and in Pistojärvi also the potato crop) are remarkably large per individual. (In calculating the harvest per individual, the population of the different communes was taken according to the census of 1907 without any correction). This comparatively plentiful harvest in the northernmost part of Carelia is important evidence that agriculture can well be carried on far north in East Carelia, even right up to the arctic circle, at least at some distance from the coast. If the present primitive level of East Carelian agriculture be taken into consideration, it

seems that, as far as climate is concerned, cultivation will be possible further north than in Finland, but it is at present not possible to pronounce a definite opinion on this point.

Finally, with regard to the grain harvest, the above particulars agree pretty well with the statement of Knipovitch and others that the native harvest suffices for the agricultural population itself for four months in the year, but that then nothing can be given to the horses and cows. The agricultural

TABLE V.

Number of Domestic Animals in the Province of Kem in 1904.

Commune	Cattle			Horses	Foals	Sheep	Reindeer
	Bulls	Cows	Calves				
Town of Kem.....	3	167	19	73	3	176	78
» » Suma	13	196	18	91	3	386	4
Solovets Monastery	14	115	15	190	33	—	—
<i>Rural Communes:</i>							
Kandalaks	3	48	6	20	—	400	675
Kouta	—	79	—	58	—	389	351
Kieretti.....	2	160	—	107	—	610	680
Oulanka	6	425	35	253	10	1,251	1,984
Kiestinki	30	870	131	400	13	2,273	3,567
Viitsataipale.....	10	260	55	124	7	260	400
Pistojärvi	6	270	50	140	3	580	3,020
Vuokkiniemi	18	540	42	200	10	2,200	—
Uhtua	21	691	103	189	8	1,011	18
Paanajärvi	7	246	52	140	12	441	—
Ponkama	14	238	82	70	8	519	174
Usmana.....	—	8	—	35	5	220	—
Kontokki.....	10	230	20	185	15	325	—
Jyskyjärvi	15	370	200	160	18	850	20
Tungut	20	220	70	260	10	520	—
Voijärvi.....	11	400	18	153	25	400	—
Suiki	2	158	40	78	15	267	32
Suikujärvi.....	13	543	64	318	22	610	—
Sorokha.....	11	390	110	308	25	700	—
Lapina	8	292	28	184	27	362	—
Koleshma	5	160	55	184	16	320	—
Njuhtsha	8	301	43	386	39	1,060	—
Whole area	248	7,377	1,256	4,306	317	16,130	11,003

population in 1904 was about 35,000 persons, and the total crop of rye and barley divided among them gives 67.5 kilogrammes per head. The remaining three quarters of the year's supply for the whole population is imported from Archangel by a special authority for the purpose, and a small quantity also through Povenets. The agricultural population consists mainly of Carelians, as was also shown by Knipovitch, while immigrant Russians form the greater part of the remainder; — merchants, priests, officials, the town population and the fishers on the coast.

Table V. affords information with regard to the *domestic animals*. Their numbers were in the year 1904; — 4,306 horses, 7,377 cows, 8,881 horned cattle, 16,130 sheep, 11,003 reindeer. A small proportion of these were within the areas of the towns of Kem and Suma and the Solovets monastery. As the number of peasant homesteads is about 6,000, this table does not show as much as one horse per homestead. A large number of homesteads have to manage without horses, a fact which is also confirmed by other information. This is fairly comprehensible, when the area of land, and of cultivated ground, belonging to the homesteads is less than that which is usually held by the cottars here in Finland. The number of cows comes to about $1\frac{1}{2}$ per homestead. Sheep are more numerous, but most noticeable is the large number of reindeer, an average of more than two per homestead. In the winter these can to some extent be used as substitutes for horses, they can be advantageously slaughtered, and they also afford some milk. If we calculate the number of domestic animals per inhabitant, for the sake of comparison with the southern provinces, with Kola Lapmark and with Finland, and if we estimate the number of inhabitants in Kola Lapmark as 12,000 (in the year 1908), we obtain the following results;

Number of Domestic Animals per 1,000 Inhabitants.

	Full grown horses	Horned cattle	Sheep	Reindeer
Province of Kem, 1904.....	108	222	402	285
Three southern provinces, 1902..	181	638	419	—
Kola Lapmark, 1908.....	11	163	386	5,636
Finland, 1900.....	102	526	363	44
» 1910.....	97	515	253	40

The number of horses per inhabitant is slightly greater than in Finland, but much less than in Olonets Carelia, the cattle are less than half as many as in Finland, about a third as many as in Olonets Carelia, but more than in Kola Lapmark, while the sheep are about as numerous as in Olonets Carelia and in Kola Lapmark, but considerably more than in Finland at the same time.

As the agricultural population cannot gain a sufficient livelihood from the cultivation of the scanty lands assigned to it — which is partly due to the primitive methods of tillage — it has to seek to supplement its income from other sources. These are found in forest work — timber-cutting and floating, and especially in fishing, while the chase also contributes to the livelihood of many. The Carelian bent for transport and trade also asserts itself, peddling being a very usual occupation which is pursued in Finland also. Many have made small fortunes thereby.

A. W. ERVASTI («Muistelmia matkalta Venäjän Karjalassa kesällä 1879»), who travelled in Kem Carelia in 1879 and the following year, and noticed the extraordinary poverty of that country, even considered that peddling in Finland was the chief source of livelihood for the population of Kem Carelia. But since then the meagre agriculture has somewhat improved, and the sea-fishing in particular has made progress, while Carelian peddling in Finland has diminished, so that in any case the above observation is now no longer true. As recently as 1907 however, I. K. INHA, who had travelled in that country (see his interesting «Kalevalan Laulumailta»), and B. AHTIA in 1910 (see «Karjalan Kirja», 1910) both considered that this peddling in Finland was a very important source of income for the regions mentioned, and that at the beginning of the century it might have been the most important source. Gradually however it had become less lucrative and lost its importance, owing to the great progress of rural trade in Finland. Ahtia gives the number of Carelian pedlars travelling in Finland as 1,048 in 1872, and 1,139 in 1893. Ervast's simple and modest descriptions of the country and people of the north of East Carelia are also instructive. They are still in most respects fully true. I therefore venture to quote from his description of the village of Uusikylä on the river Kieretti, which is situated about 40 kilometres (as the crow flies) south-west of the village of Kieretti. This, like all his descriptions of his travels, illuminates the life and people, the primitive culture and the world of ideas of these desolate regions.

«Uusikylä consists of ten homesteads, which stand in a row but are not quite close to one another — or rather of ten small cottages, (mökkiä), for that is what they really are. Below the cottages, down to the shores of the



Fig. 49. Uhutjoki River. Parts of the Village of Uhtua
in the background.

Photo *J. K. Inha.*



Fig. 50. Village of Kolkari on the Sununjoki. The church and the
Trees in the burial ground are visible in the background.
Lindajärvi, Province of Povenets.

Photo *P. Eskola.*





Fig. 51. Old Homestead. One older part and two newer parts built at different times for the sons of the house, Village of Plakunvaara, Province of Povenets.

Photo P. Eskola.



Fig. 52. Natural Meadow, and a Barn which is used as a dwelling for the haymakers during the long hay harvest on distant, outlying lands. Two dinner tables in front of the barn. Village of Selkie, Paadene, Province of Povenets.

Photo P. Eskola.



lake, was meadow, and above them perhaps a square pole of ploughland. The cows were the most valuable property of the village, and at the beginning of the summer these had numbered fifteen, but the bears had recently killed one and severely mauled another, so that now there were really only thirteen. Of horses, of which Kieretti possessed more than twenty, there had been four in Uusikylä during the winter, but the bears had also killed one of these, so that there were now only three horses in the village. Thirteen cows, three horses, ten old cottages and a little fishing tackle — what value does the reader set on the village of Uusikylä?

The inhabitants of the village did not complain of poverty, severe though their poverty apparently was, and begging was as unknown here as elsewhere in Carelia. The only ground of complaint was the bears and their ravages, and this complaint was bitter enough, and also, as shown above, well founded. Immediately we left Kieretti, the guides had asked whether we had or knew of any »means of driving off bears» (karhun pelottimia). It would have been interesting to know what they meant by this, but unfortunately my companion could not keep silence, but answered by asking what other means there could be than good guns, axes and pikes. It is probable that the guides had in mind some kind of magic, as appears from the fact that I finally got them to tell me that bears had also caused much damage at Kieretti, until there came a shepherd from the interior of the country who by incantations and other means had completely driven them off. No doubt my companion's advice was fairly good, but whether it could be followed is another question. There was probably no gun in the whole village except the old flintlock we had with us on the journey, which might perhaps have hurt us more than it helped if we had been attacked by the bears.»

In spite of the poverty which at present prevails, and the unspeakably primitive level of the population in regard both to agriculture and to much besides, there is no reason to mistrust the future of agriculture in these regions. The study of the conditions of East Carelia, its land, climate, people and tillage, leads to the conclusion that there are definite possibilities before agriculture even in the north of the country. If only the conditions of land ownership were so arranged as to give the peasants as much land of their own as an agriculturalist absolutely must have if he is to make his way, there would be a possibility of improvement. There is, however, one great difficulty in the way; namely the fact that the Carelians live in very large and closely populated villages which are many miles distant from each other.

It is easily comprehensible that once upon a time these dwellers in the wilds preferred to concentrate themselves in large villages, as they did not

till the soil to any extent, and were therefore not obliged to take into consideration the possibility of tillage in the immediate neighbourhood when they chose their dwelling places. It was easy to hunt and fish, and even to burn-beat at a somewhat greater distance from home, not to speak of the trading journeys in foreign lands, but real agriculture, with manures and scientific use of the soil, cannot be carried on when the land is at an immense distance from the dwelling house. Yet if the tens and even hundreds of homesteads in a single village are all to be given cultivable land, even if only in small lots of ten to twenty hectares, the greater number of these lots must be selected at a very considerable distance from the village. For the good, cultivable, solid land does not form large continuous stretches. If it did, the matter could be arranged with less difficulty. It generally consists of small plots, divided by ridges, moors and peat bogs, and must therefore often be sought at very great distances from the village. The problem would become much easier if the population learned bog-cultivation — as it will have to do sooner or later — but in any case, if efficient agriculture is to come about, there will have to be a well devised division of the land, with a suitable spreading out of the homesteads. Only then can there be any satisfactory result.

It may be added that, while the population of Kem province has increased from 10,885 to 42,242 between 1813 and 1912, the villages have grown in size, i. e. in their number of homesteads and inhabitants, rather than in number. From the time when LÖNNROT wandered in these districts between 1830 and 1840, till 1879, when Ervast visited the same regions and up to the present day, the number of homesteads in the villages has increased two and even threefold. When the population of a village grew by natural increase, the young people have remained in the village, lengthened the roof and walls of their father's dwelling and set up their own household there (see. Fig. 51), or finally built a cottage of their own, thus adding a homestead to the village. But thereby the land, scanty before, became still more inadequate for the cultivators. The young people would not go out into the wilds, even if land could be obtained there. But this must not go on. **THE YOUNG PEOPLE MUST LEAVE THE OLD HOME, AND THE MAIN VILLAGE;** that is the very thing they must do. While this great country with good cultivable land for hundreds of thousands of people, and possibly more, is still excessively thinly populated, with 0.6 persons to the square kilometre, there is serious overpopulation in the villages, nearly 100 persons on one square kilometre of the land that belongs to the communities. This to some extent explains why the male population seeks subsidiary income from peddling; sea-fishing etc. It is true that in most cases there is still a good deal of cultivable land belonging

to the communities which has not been taken up, not to speak of the fact that the primitive methods of cultivation could be improved, but in the larger villages many of these plots are at a very great distance from the village itself, that is from the place where the homesteads are built, and it is necessary to remove from the actual village even to get these plots cultivated, in so far as that can be done with advantage.

This is particularly the case in Olonets Carelia. In spite of its more southerly position, between the sixty-first and sixty-fourth north latitudes, and the fact that the soil is considerably more fertile than in the province of Kem which lies between the sixty-fourth and sixty-seventh latitudes, and in spite of the fact that in the southern provinces the communities own many times more land, 80 hectares per homestead (144 in Povenets) against seven in Kem, yet the amount of cultivated land averages only 2.1 hectares per homestead, and about one hectare in the north-west districts of Olonets and in Povenets, that is, scarcely more than in the province of Kem. If ever one can say that figures speak, it is true here, for they show that although the villages of Olonets Carelia own much land, and usually a good deal of cultivable soil, the cultivated area is still very small.

Thus in the three provinces of Olonets Carelia the cultivated ground averages only 2.65 % of all the land owned by the villages, in Povenets it is only 1.35 % (in one commune only 0.23 %), against 8.66 % in the province of Kem. (This last figure is obtained by comparing the amount of land tilled by the peasants with the sum of all the land owned by the communities plus the land leased from the state. If only the land owned by the communities is used for the comparison, as in the southern provinces, the percentage comes to 10.40). The reason for this remarkable fact is of course that the numerous homesteads in a village are concentrated round one and the same spot, so that the distance from all to the greater part of the cultivable soil becomes exceedingly great. At hay-time the inhabitants remove completely to the meadows, which are many tens of kilometres distant, and establish temporary households there (Fig. 52). How can the cultivation of this land be made profitable? Unfortunately there are somewhat similar conditions in many parts of Finland, especially in the north, but not only there. If the tillage of the East Carelian provinces is to be developed and improved, there must be a division of the land, and an appropriate dispersion of the homesteads. The state ought to do all it can to assist agriculture, and must help here by granting land where necessary. That is, in cases where the village has too little land, which is especially the case in Kem, it must assign land for colonisation on favourable terms. But this land must on no account be given to the village

community as a whole, but granted to settlers who have a bent and talent for agriculture, and these may also be assisted with timber and other necessities for their first homes. The population increases rapidly, so that the colonisation ought to be able to proceed fairly fast. The colonists may very well settle in small villages, there are advantages in their so doing, but the homesteads must be so placed and their lands so divided that each homestead has its own land in its immediate vicinity. Too much land ought not to be granted either, this only affords a temptation to too extensive cultivation, while the cultivation ought to be made as intensive as is possible in this northern country. When the tillage is successful, more land can be assigned later on. As the women are very capable, it ought also to be possible to introduce efficient cattle rearing and dairying, if only practical instruction were given. The state forest work, again, affords the opportunity for extra earnings, as well as affording purchasers and places of sale for agricultural produce. If bog-cultivation is also assisted and makes progress, it ought to be possible for agriculture to make great advances, for the land gradually to be populated, and for poverty to be replaced by prosperity and culture. Agriculture ought then to be able to compete with forestry and industry, which have also great opportunities of advancement in this country. Moreover, these different occupations need each other's support, and afford it mutually when progress is sound. Thus we may hope for great and important improvement in agriculture, and a securer, happy future for the agriculturalists in this hitherto so little known and little productive land.

THEODOR HOMÉN.

2. The Forests and Forestry.

Provinces of Olonets, Petrosavodsk and Povenets in the Government of Olonets.

The extent of the forests, the rights of ownership, the kinds of timber, and its general condition. According to the information available, the area of Olonets, Petrosavodsk and Povenets, *excluding water* is divided among the various groups of owners as follows; —

Ownership of the Land in 1902.

Province	Area excluding water	The state or public institutions, in hectares	Land owned by				
			%	Private owners, in hectares.	%	The peasants, in hectares	%
Olonets.....	952,339	499,189	52.42	4,722	0.50	448,428	47.08
Petrosavodsk ..	1,546,189	601,625	38.91	62,356	4.03	882,208	57.06
Povenets	4,088,032	3,447,349	84.33	3,656	0.09	637,027	15.58
Total	6,586,560	4,548,163	69.04	70,734	1.07	1,967,663	29.89

Out of the land area included in the table which belongs to the state or public institutions, 4,481,419 hectares (487,184 in Olonets, 573,872 in Petrosavodsk and 3,420,363 hectares in the province of Povenets) is under the control of offices of state, generally the Department of Forestry. The rest consists of the land belonging to the towns (43,580 hectares), the monasteries (17,504), the church (5,629) and other public institutions.

Out of the 70,734 hectares entered under the heading of *private owners*, 9,064 hectares are calculated to belong to the nobility, 12,039 to merchants, 47,303 to peasants, and 2,328 to private factories. (Cp. the description in the chapter on *Agriculture and Cattle Rearing*).

The last column shows the area belonging to the village communities, or the agricultural peasantry, and amounts to a total of 1,967,663 hectares, also to some extent under state control.

The information supplied by the zemstvo of the government for the year 1908 shows that the greater part of the land belonging to the state (4,081,696 hectares out of 4,481,419) consists of *state forests* under the care of the Department of Forestry. The rest of the state landed property consists for the most part of lands administered by the Board of Mining Industry.

The said state forests were in the year 1908 divided between the provinces as follows:

Province	Total area of state forests	Amount of utilisable ⁽¹⁾ forest land.	Percentage.
Olonets	464,465	326,595	70.0
Petrosavodsk	373,932	252,256	67.5
Povenets	3,243,299	1,978,613	61.0
Total	4,081,696	2,557,464	62.7

(¹) Obviously productive and moderately productive forest land.

An older statement, however, from the Department of Forestry, gives the area of the state forests as 4,184,282 hectares divided between Olonets, Petrosavodsk and Povenets as follows;

Province	Total area of state forests	Amount of »utilisable forest land»	Percentage
Olonets	462,458	311,472	67.35
Petrosavodsk	372,324	250,948	67.40
Povenets	3,349,500	1,406,269	41.98
Total 4,184,282		1,966,689	47.05

The zemstvo's report regards the figures first given as more accurate than the last, as being based on more recent calculations, especially with regard to the »utilisable forest land» in Povenets. We have, however, given also the second set of figures, because these are the ones which agree with those in the following table, showing the names of the different forest demesnes (datcha), surface conditions, kinds of trees, age, density and quantity of timber per hectar.

As seen from the next table, the state forests of Olonets are divided into eighteen demesnes of varying sizes. There are five forestry districts in the province, namely Vaasheni, Olonets, Videle, Tulemajärvi and Kotkatjärvi. Pines and firs are fairly equally divided, the fir having a slight preponderance. Deciduous forest forms fifteen per cent of the whole. The age of the forests varies in general between 100 and 220 years, but is in some state forests only 50—80 years. The timber is for the most part good and tall, in places reaching the height requisite for masts. The density varies between 0.4 and 0.8, averaging 0.7⁽¹⁾. The amount of timber in the state demesnes varies from 130 to 300 cubic metres per hectar of utilisable forest land. The quantity of sawlogs is said to be from 10 to 50 % of the whole amount of timber.

In the province of Petrosavodsk there are eight extensive state forest areas, which form five forestry districts. These are Pyhäjärvi, Kishkoi, Säämäjärvi, Ostretchino and Vosnesenia. Here the pine has the preponderance, forming 50 % of the whole, while the fir forms 30 % and deciduous trees 20 %. The average density of forest is 0.7. The age of pine and fir forests varies between 80 and 200 years, that of deciduous forest between 30 and 80 years. The timber is in general good and high, and mast

⁽¹⁾ In forestry documents, density of forest is denoted by the figures 0.1—1.0, 0.1 signifying almost treeless forest land, and 1.0 the densest forest.

Area of the State Forests, Kinds of Trees and Quantities of Timber.

Province and Forest Demesne (datcha)	Total Area, in hectares.	Utilisable land, in hectares	Kind of Tree			Age		Density	Cubic metres per hectare	Percentage of timber trees.
			Pine %	Fir %	Deciduous Trees, %	Pine and fir forest	Deciduous forest			
<i>Olonets:</i>										
Tulemajärvi . . .	64,676	43,700	30	60	10	100—220	?	0.7	175	12
Vieljärvi . . .	17,699	15,186	20	50	30	120—200	?	?	175	12
Suurmäki . . .	26,657	21,413	40	40	20	120—200	?	?	175	12
Videle	13,110	9,723	60	30	10	120—200	?	0.7	190	?
Kroshnojärvi . .	2,185	1,748	20	60	20	100—160	?	0.7	225	15
Sadnenikifor skoi	23,926	9,942	50	30	20	120—180	?	0.7	225	16
Kotkatjärvi . . .	76,694	57,793	30	60	10	120—200	?	0.7	300	20
Verhovskoi . . .	13,219	9,614	50	40	10	50—80	?	0.7	130	10
Kontushe	4,916	4,042	30	50	20	120—220	?	0.7	175	12
Tuulos-Sandeb-skoi	23,817	—	60	30	10	120—220	?	0.7	175	12
Illinski	7,320	3,824	60	40	—	80—120	—	0.6	130	?
Mäkri	1,202	437	90	10	—	10—60	—	0.8	160	—
Obsa	27,968	12,892	70	20	10	70—140	?	—	175	20
Sambatuskoi . .	19,556	16,497	30	60	10	120—170	?	0.7	225	?
Kontusche-Lojanskoi N:o 1	23,380	17,152	50	30	20	60—180	?	0.8	250	30—40
Kontusche-Lojanskoi N:o 2	21,522	14,093	50	30	20	60, 1 0	?	0.8	250	30—40
Vaasheni N:o 1	49,818	39,221	20	70	10	120—180	?	0.7	250	20
" 2	44,793	34,195	15	70	15	80—120	?	0.8	275	50
Total and average	462,458	311,472	35	50	15	—	—	0.7	238	24
<i>Petrosavodsk.</i>										
Lintajärvi	82,265	70,029	80	15	5	?	?	0.6	175	15
Munjärvi	5,026	3,387	50	30	20	?	?	0.7	140	20
Kulmukskoi . . .	1,311	1,202	70	20	10	100—150	30—80	0.7	175	?
Kishkoi	26,329	16,388	50	20	30	100—200	20—80	0.7	150	?
Säämäjärvi . . .	82,265	31,027	50	30	20	?	?	0.7	250	24
Pyhäjärvi	29,716	24,581	60	20	20	80—180	?	0.7	225	24
Ostretshimo N:o 1	60,743	48,944	30	50	20	?	?	0.7	200	?
" 2	84,669	55,390	30	50	20	160	80	0.7	200	?
Total and average	372,324	250,948	50	30	20	—	—	0.7	197	22

Province and Forest Demesne (datscha)	Total Area, in hectares	Utilisable land, in hectares	Kind of Tree			Age		Density	Cubic metres per hectare	percentage of timber trees
			Pine %	Fir %	Deciduous Trees %	Pine and fir forest	Deciduous forest			
<i>Povenets:</i>										
Kiimasjärvi . . .	126,293	39,330	80	10	10	100—200	40—60	0.7	225	26
Repola N:o 1 . . .	410,343	185,725	70	20	10	90—200	?	0.7	225	20
Repola N:o 2 . . .	253,460	76,475	80	20	—	100—200	—	0.7	200	17
Rukajärvi	312,127	48,070	80	10	10	100—200	30—90	0.6	180	17
Paadene	514,349	151,530	70	20	10	100—200	30—90	0.5	125	10
Selki	445,412	205,827	70	30	—	?	—	0.7	200	15
Uikujärvi (parts)	338,894	145,303	80	10	10	150—250 —300	?	0.5	125	?
Etelä-Uiku- järvi	222,433	94,283	60	30	10	100—200 —250	30—90	0.5	125	15
Sumsaari	16,060	5,135	70	20	10	100—200	40—100	0.6	125	?
Lintajärvi	62,273	24,472	70	30	—	—	—	0.7	200	15
Semsjärvi	34,086	16,825	70	20	10	100—300	?	0.7	190	10
Semsjärvi (second lot)	30,918	19,665	70	20	10	100—250	?	0.5	80	10
Semsjärvi- Kischkoi	75,820	45,885	70	20	10	100—200	?	0.6	175	15
Kischkoi	2,731	2,185	60	30	10	100—200	30—80	?	130	?
Tungskoi	16,825	8,740	60	20	20	100—200	30—90	0.5	130	?
Lumbujoki	31,792	19,665	60	30	10	100—200	30—80	0.5	130	?
Tihvinoborskoi (southern part)	224,509	160,270	60	30	10	100—200 —250	40—100	0.6	100	?
Tihvinoborskoi (second lot)	175,893	119,083	60	30	10	—300	?	0.6	130	?
Voljärvi	1,530	1,093	70	20	10	?	?	0.5	80	10
Mustametsä outlying forest	1,857	983	50	30	20	?	?	0.6	130	10
Orschemjoki	4,152	2,841	70	20	10	?	?	0.7	130	10
Pigmaschkoi	323	109	70	20	10	?	?	0.5	80	10
Pudoschkoi	47,415	32,775	60	30	10	?	?	0.6	130	12
Total and ave- rage	3,349,500	1,406,269	70	20	10	—	—	0.7	158	16

trees occur here and there. The quantity of timber varies from 140 to 250 cubic metres per hectare. Sawlogs form 20—25 % of the whole quantity of timber.

In the province of Povenets there are twenty-three state demesnes, varying in size from 328 to 514,349 hectares. There are nine forestry districts, Repola, Povenets, Uikujärvi, Selki, Tihvinoborskoi, Rukajärvi, Semsjärvi, Paadene and Sunku. The pine generally preponderates (70 %), while the fir forms 20 % and deciduous trees only 10 % of the whole. No deciduous forest at all is reported from some demesnes. The age of the pine and fir forest varies between 90 and 300 years, that of deciduous forest between 30 and 100 years. The density averages between 0.5 and 0.7. The quantity of timber is 80—225 cubic metres per hectare, of which sawlogs form 10—26 %.

The forestry districts in the government of Olonets have an average extent of 186,541 hectares, chief woodwards' districts of 45,439 and woodwards' districts of 10,012 hectares.

The total area of the land controlled by the Board of Mines and other national authorities or belonging to the towns, monasteries and church is 568,467 hectares. It is estimated that 550,000 hectares of this is forest, about 400,000 hectares of it utilisable. The kinds of timber, its age, and the general character of the forest is the same as that of the state demesnes in the same regions.

Out of the 70,734 hectares belonging to private individuals, it is estimated that 69,368, or 98 %, consists of forest land, of which 70 %, 49,549 hectares is «utilisable». A remarkable proportion of the land in private ownership consists of large estates where the sale of timber is the most important matter and agriculture only secondary. This is specially true of the estates belonging to nobles, merchants and factory owners. The following description of the condition and use made of these private forests is given in a publication of the zemstvo of the government of Olonets; — Материалы по Статистико-Экономическому Описанию Олонцакаго Края 1910.

»The forests have been cut down without any method; the abundance of water ways for timber floating, and the proximity to the Petersburg and foreign timber markets have made it possible to exploit all timber products. There has been no real forestry at all in these regions. Everything which had any marketable value and could bring profit to the seller has been offered for sale. The forest owners see no object in tying up capital in timber-working, when there is a demand for the raw material as it is, and the result of this point of view is that there is scarcely any timber-working industry in these regions. It is found most profitable to export the raw material direct from the forests». Many of these private forests have been badly cut about, and in the places where they have escaped, this has been due to difficulties of transport. In spite of this merciless felling, however, the supply of timber is (1905) still great, and furnishes a considerable quantity of logs and fuel, almost as

great as twenty or thirty years ago, but with the difference that the size of the logs has diminished, and fuel is hewed from wood of inferior quality. Twenty or twenty-five years ago no tree was felled unless it measured five vershoks (22 $\frac{1}{2}$ centimetres) at a height of three fathoms above the ground. Now much smaller stems are taken, and the timber is felled before it is full grown. As sawlogs are most in demand, they are the forest product which has been most devastated.

Out of the 1,967,663 hectares belonging to the peasant communities, 1,771,082 hectares are called «forest lands». This area includes 1,069,382 hectares of real, utilisable forest, and 701,700 of bog, rock and waste land. These are divided between the three provinces as follows;

Province	utilisable forest land	bog, rock and waste land	total.
Olonets	274,966	119,287	394,253
Petrosavodsk	464,737	308,544	773,281
Povenets	329,679	273,869	603,548
	<hr/> Total 1,069,382	701,700	1,771,082

The peasants of the government of Olonets have only a conditional right to their forests and the forest produce. The population is allowed to take wood from the forests for household requirements, and to sell a portion of the timber for cutting, but the sums thus realised do not go to the peasants. The capital is placed in state funds, and the money may only be drawn with the permission of the appropriate authority. This regulation has helped to protect the forests, although illegal timber cutting has been general. Since the year 1905, now that legislation has put the peasants on the way to become the owners of their plots of land, there has been a striking increase of timber selling, generally for a mere song. The authorities report that it is almost impossible to combat this evil, for volosts and zemstvos with one or two woodwards cannot bring to book such illicit timber trade, especially as the peasants feel no obligation to obey the prohibition, and regard themselves as complete owners of the land which has been granted to them. It is specially remarked that in spite of this devastation of the forests and in spite of the great forest fires which ravage these regions every year, the forests still possess «an enormous quantity of exceedingly valuable timber». Generally speaking, the forests belonging to the peasants were about the year 1905 still little behind the state forests in the quantity of timber they contained.

According to the information which is available, it would seem that the

forests of Olonets, Petrosavodsk and Povenets altogether come to 6,472,146 hectares (98 % of the whole land area, excluding water) and that of this 4,076,395 is utilisable (productive and fairly productive) forest land.

The amount of timber in the forests. Direct detailed figures of the amount of timber in the forests of Olonets Carelia have not been obtainable. An approximate calculation is, however, possible from the table we have, showing the extent of the state forests, the quantity of timber per hectare, the percentages of sawlogs, and the particulars as to the kinds of tree. The calculations give the following result as far as the amount of timber in the state forests is concerned;

Amount of Timber in the State Forests.

Province	Area of the state forests		Amount of timber in the state forests			
	Total area	Utilisable land	Pine and Fir Forest	Deciduous Forest	Total	Timber Trees (included in the foregoing)
	Hectares		Cubic metres of solid timber			
Olonets . . .	462,458	311,472	64,265,000	9,847,000	47,112,000	17,054,000
Petrosavodsk	372,324	250,948	40,655,000	8,897,000	49,552,000	10,833,000
Povenets . .	3,349,500	1,406,269	206,635,000	16,925,000	223,560,000	35,733,000
Total	4,184,282	1,868,689	311,555,000	35,669,000	347,224,000	63,620,000

The »utilisable» or according to our terminology, the »productive» forest lands give the following average quantities of timber per hectare;

Quantity of Timber per Hectare of State Forests.

Province	Pine and Fir Forest	Deciduous Forest	Total	Timber Trees
	Cubic metres of solid timber			
Olonets	206	32	238	55
Petrosavodsk .	162	35	197	43
Povenets	146	12	158	25
Average for the whole area .	158	18	176	32

If we assume that the average cubic volume of timber trees shown in the table is composed of trunks of 0.80 cubic metre average size (a diameter of about 30 centimetres at breast height), there would be an average of 69 timber trees per hectare in Olonets, 54 in Petrosavodsk and 31 in Povenets. Thus in the whole area there would be an average of 40 timber trees per hectare. This calculation would give a total of 78,700,000 timber trees of the size supposed in all the state forests.

As was to be expected, these calculations correspond to the quantities of timber in the Carelian forests on the Finnish side of the frontier. The forests on the two sides of the frontier are also in the main the same in appearance and character of growth. Further north, in Povenets, the forest lands become more barren, and the trees lower and less dense. In the province of Petrosavodsk, on Lake Onega, the ground is richer and the forests grow faster and more luxuriantly, with the result that the percentage of mixed and deciduous forest is higher. In the Ostretchino forests west of southern Onega, on the other hand, the percentage of fir is higher. The best forests, however, are in the province of Olonets, in the state demesnes of Kotkatjärvi, Sadnenikiforskoi, Kontushe—Lojanskoi and Vaasheni, or in other words on the upper and middle reaches of the Olonka and Vaasheni rivers, and thence southwards towards the Svir. Here, for example in Kotkatjärvi demesne, the quantity of timber per hectare rises to more than 300 cubic metres.

The amount of timber in the forests controlled by the Board of Mines and other authorities and belonging to the towns, monasteries and church, ought to be calculable from the above averages for the state forests. Thus estimated, the quantity of timber in these forests would be as follows;

Pine and fir forests	.....	63,200,000	cubic metres.
Deciduous	»	7,200,000	» »
		<hr/>	
		Total	70,400,000 cubic metres.

Timber trees (included above) 8,800,000 cubic metres.

The number of timber trees would then be about 11,000,000.

It has already been mentioned that the forests in private ownership have in course of time already been felled to an appreciable extent. The large timber has mostly been sold, and the smaller timber thinned and spoiled by unscientific and — from the point of view of forestry — unprofitable cutting. Nevertheless, according both to published information and to verbal assurances, the timber in these forests may even now be estimated, in spite of all, at about 80 square metres per hectare of »utilisable forest». Seeing that the area

of these forests is, as stated above, 49,549 hectares, the timber in the private forests of Olonets, Petrosavodsk and Povenets may be estimated in round figures at about 4,000,000 cubic metres of solid timber. About 3,200,000 cubic metres of this would be pine and fir, and 800,000 deciduous trees. The volume of timber trees can scarcely be given even in estimate.

Forests belonging to the peasant communities. We have already referred to the belief that these forests are not far inferior to those belonging to the state. They have to some extent been protected by the fact that the peasants had no right of freely disposing of them. It is, however, probable that conditions have changed during the last few years. We have stated that the authorities complain that since 1905, when the peasants were to be given full rights of ownership in their plots, «illicit cutting» has begun to increase so much that it cannot be prevented. It is probable that this cutting has still increased during the last decade. This is likely to have been especially the case during the war, when the shortage of coal and mineral oil in Petrograd caused an enormous importation of wood into that city, some of it from Finland. In Olonets Carelia it has been the provinces of Olonets and Petrosavodsk which were most exposed to this timber cutting, which was of course generally carried on without any reference to the principles of forestry. The forests of Povenets, on the other hand, were probably better protected by their remote position and poor means of communication.

In estimating the quantity of timber in the forests belonging to the peasant communities, we cannot use the same averages as applied with regard to the timber in the state forests. According to probable estimates however, we may take the following approximations for the three provinces together without danger of being very greatly mistaken;

Pine and fir forest, 110 cubic metres per hectare of utilisable forest land.									
Deciduous	»	10	»	»	»	»	»	»	»
	<hr/>								
	Total	120	»	»	»	»	»	»	»
Timber trees		20	»	»	included above.				

According to these figures, the whole amount of timber in the peasants' forests would be as follows;

Pine and fir forest	.....	117,700,000 cubic metres.
Deciduous	»	10,700,000 » »
	<hr/>	
	Total	128,400,000 cubic metres.
Timber trees	.....	21,400,000 cubic metres.

The number of timber trees would thus be about 26,750,000.

According to these calculations, the total amount of timber in Olonets, Petrosavodsk and Povenets would come to about 550 million cubic metres, or an average of 135 cubic metres per hectare of utilisable forest land. It will have been noticed that in making these calculations we have omitted the less valuable timber which is to be found on bog and other waste land.

Timber cutting and transport. The methods of hewing and transport are the same as in Finland. The trees are felled, shaped to logs or fuel and conveyed to the water course where they are to be floated, by forest workers on contract work, most of whom are the peasants of the neighbourhood. The payment depends on the length and thickness of the logs and the distance they have to be conveyed. Fuel cutting is paid by the «forest cord», which varies in size.

The most frequent cords are the «shesterka» and the «deviatka». The former varies in height from 10 to 12 tchetverts and in length from 18 to 24 tchetverts (1 tchetvert = 7 inches) while the latter is 9–10 $\frac{1}{2}$ tchetverts high and 18–24 long. The fuel is cut into lengths of 1 $\frac{1}{2}$ arshins in the shesterka cord and 2 $\frac{1}{4}$ arshins in the deviatka cord (1 arshin = 28 inches).

The purchaser arranges for the floating himself, or if he contracts for it, the contractor is supplied with all necessaries, from cables, ropes, anchors and boats to the very eating vessels for the workmen. It used to be the custom for each purchaser to manage his own floating, but in the larger waterways joint floating is now the rule.

The timber from the southern provinces is floated along the waterways to Ladoga, and thence to Petrograd. Some of that from Petrosavodsk stops at the sawmills round Lake Onega. Povenets may be divided from this point of view into three districts. The north-western district, which is the smallest, sells and transports most of its timber to Finland, a rather larger district in the south sends its timber to the sawmills on Lake Onega or even to Petrograd, while the timber from the largest district, that in the north, is transported to the coast of the White Sea and to the sawmills there situated.

Timber floating usually begins about April 15th to 20th, but in the north not before the beginning of May. In the streams and rivers the timber is floated in the same way as in Finland. On Lake Onega it is transported in rigid rafts, which are towed in strings of 20 or 30 to Vosnesenia at the mouth of the Svir. If the weather is favourable the journey from Povenets to Vosnesenia takes three days, but in the contrary case it may take as much as a fortnight. The timber from the spring floating does not usually reach Petro-

grad until the autumn. Before the war, the average cost of transport from Povenets on Lake Onega to Vosnesnia was 15 kopeks per log, and the cost of towing thence to Petrograd, 40 kopeks. The average cost per log in the province of Povenets, including transport to Petrograd, was 1 rouble 20 kopeks, a charge which can only be borne by the larger timber.

As for the floating to Finland, timber from Repola in the province of Povenets is transported for example as far as Kotka, a journey of 800 versts, 105 versts in the province of Povenets and the rest in Finland. Nevertheless the cost per log was little more than a rouble, or cheaper than export to Petrograd.

Fuel and props are floated loose or in small rafts until they can be conveyed by barges. The fuel is then generally landed and sawn into billets of suitable length. The barges carry 400—650 cords, according to the size of the cord and the dryness of the wood. The tugs tow several barges in a string down the Svir, the canals and the Neva to Petrograd.

The cutting and transport of timber is an important source of income to the inhabitants of Olonets Carelia. This is shown by the following figures for the years 1905—1908 for the whole government of Olonets.

Number of workmen and their earnings from the cutting and transport of timber in the government of Olonets, in the years 1905—1908.

Kind of Work.	1905		1906		1907		1908	
	Number of workers	Earnings in roubles	Number of workers	Earnings in roubles	Number of workers	Earnings in roubles	Number of workers	Earnings in roubles
Felling, transport and preliminary work	25,410	995,324	25,835	1,036,280	27,170	1,122,023	24,710	908,780
Floating	6619	90,378	10,060	204,684	9,911	142,952	10,413	189,451
Other water transport	6,557	375,312	6,780	233,888	44,38	216,332	4,249	269,333
Total	38,586	1,461,014	42,675	1,474,852	41,519	1,481,307	39,372	1,367,564

Sale and delivery of timber products. As is to be expected, the demand for timber floated to the White Sea by the waterways of the province of Pov-

enets is almost entirely for large logs. It is said that recently purchasers in this region have not been inclined to accept timber under 6 vershoks \times 9—10 arshins (= $10 \frac{1}{2} \times 252 - 280$ inches). As a rule only the lower part of a stem is taken, the top being left in the forest. On the other hand, smaller timber is transported from Povenets to Finland, and, as has been stated, not only logs but also fuel and props to Lake Onega. The northern part of Lake Onega is the chief centre of the timber trade in the country. Here are the sawmills that work for the export trade, two of them in Povenets and four in Petrosavodsk. But they only consume a comparatively small amount of raw material. As stated above, the timber produce is by preference sold unworked, direct to the place where it is to be used, in Petrograd or abroad, instead of any intensive wood-working industry being carried on in its country of origin. The demand for wood produce, especially fuel, grows keener as Petrograd is approached. In the north of the province of Petrosavodsk the trade in large timber has the predominance, but further south, as also in the province of Olonets, the chief trade is undoubtedly in smaller stuff. As a rule, Olonets furnishes half the amount of fuel which is transported down the Neva to the Petrograd market, (cp. the chapter on Trade and Industry).

The state forests supply the greater part of the timber which is exported from this province. The following table shows the quantities of wood produce supplied by these forests between 1874 and 1908.

Timber supplied by the state forests in the years 1874—1908.

Year	Province of Olonets		Province of Petrosavodsk		Province of Povenets		Total	
	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber
Annual average 1874—78	15,040	189,140	31,420	112,040	146,700	36,120	198,160	337,300
» » 1879—83	8,920	165,840	100,680	115,160	188,380	4,660	297,980	385,660
» » 1884—88	20,180	120,780	36,960	131,260	173,060	29,500	230,200	281,540
» » 1889—93	50,440	152,400	59,720	130,680	154,880	52,420	265,040	335,500
» » 1894—98	25,280	112,440	25,540	76,900	120,340	83,100	171,160	272,440
» » 1899—03	165,860	274,200	191,680	98,840	265,800	76,900	623,340	449,940
year 1904	192,700	154,300	255,700	138,800	307,400	234,000	845,800	527,100
» 1905	146,400	445,600	161,700	126,200	278,700	38,800	586,800	610,600
» 1906	134,300	501,000	183,700	115,500	346,600	23,300	664,600	639,800
» 1907	231,700	403,900	159,800	78,600	384,000	11,600	775,500	494,100
» 1908	147,800	553,400	134,600	77,600	357,000	11,600	639,400	642,600

The average amount of timber cut annually per hectare of utilisable forest land in the crown forests was in the years 1906—1908;

In the province of Olonets	1.08 cubic metres.
» » » » Petrosavodsk	0.43 » »
» » » » Olonets	0.06 » »
Average for the three provinces	0.24 » »

These figures are low in comparison with Finland, where the corresponding quantities of timber cut in the Carelian state forests are about 1.15 — 2.56 square metres per hectare. Only in Olonets is the figure at all satisfactory, and even there a still higher figure might have been expected in view of the great demand for wood produce. The figure of 0.06 cubic metres for Povenets points to a condition which is very much the reverse of intensive; the output is less than in the adjacent state forests of northern White Sea Carelia. Thus the average annual amounts of timber cut in the province of Kem in the years 1906—1908 were 0.13 cubic metres per hectare in Vuokkiniemi forestry district, 0.10 in Uhtua, 0.16 in Sorokka and 0.26 in Suma. (Cp. table on page 209). Owing to the remote position of the state forests, which are situated on the watershed between the rivers which flow respectively into the White Sea, Lake Onega and on to the Finnish side, the distance is greater, transport more expensive, and therefore the demand for timber less than in territories which lie nearer to the White Sea, Lake Onega or the Finnish frontier.

The following table shows the quantities of wood produce supplied by the forests in private ownership between 1874 and 1908.

Timber supplied by the privately owned forests in the years 1874—1908,

Year	Province of Olonets		Province of Petrosavodsk		Province of Povenets		Total	
	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber
Annual average 1874—78	18,580	17,400	12,900	27,760	34,020	10,280	65,500	55,440
» » 1879—83	3,240	9,900	8,920	38,060	23,340	8,920	35,500	56,880
» » 1884—88	2,480	5,860	12,620	41,360	37,340	8,340	52,440	55,560
» » 1889—93	7,840	1,160	14,420	2,700	32,680	38,640	54,940	42,500
» » 1894—98	—	—	11,480	14,740	19,920	10,480	31,400	25,220
» » 1896—03	—	—	62,740	58,440	13,840	26,980	76,580	85,420
year 1904	—	—	6,700	49,500	19,400	34,900	26,100	84,400
» 1905	—	—	8,800	51,400	10,000	—	18,800	51,400
» 1906	2,300	9,700	47,500	22,300	—	14,500	49,800	46,500
» 1907	2,300	—	42,100	94,100	—	—	44,400	94,100
» 1908	—	16,500	20,600	6,700	11,500	11,600	32,100	34,800

The figures in this table do not suggest any such increase of production as is shown by the state forests. On the contrary, a certain decline is observable, especially in the case of logs. Trade in these seems almost to have ceased in the province of Olonets, which suggests that the large timber in the private forests has already been exhausted. For the rest, the statistics issued by the zemstvo of the government, referred to above, point out that the primary figures on which this table is based may be unreliable and inaccurate, seeing that they are gathered from private landowners. The sales and consumption may possibly be greater than has been reported.

The statistical information available for the forests belonging to the peasants begins only with the year 1894. The following table gives the figures from 1894 to 1908.

Timber supplied by the forests owned by the peasants in the years 1894—1908.

Year	Province of Olonets		Province of Petrosavodsk		Province of Povenets		Total	
	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber
Annual average 1894—98	9,420	87,000	29,240	40,990	43,880	22,160	82,540	150,160
„ „ 1899—03	68,160	145,990	107,380	75,920	129,020	52,060	304,560	274,970
year 1904	—	90	100	—	100	60	200	150
„ 1905	—	15,630	4,700	32,135	46,600	349,700	51,300	397,465
„ 1906	66,400	35,060	76,200	135,050	92,100	70	234,700	170,180
„ 1907	45,000	154,420	146,900	155,500	180,800	50	372,700	309,970
„ 1908	300	53,490	24,900	88,550	152,900	1,075	178,100	143,115

The figures concerning the peasants' forests only include the cutting and sales which took place under official control. The illicit dealing in wood produce which has been so active in recent years is thus not included in the table.

We have not been able to obtain information with regard to the cutting and sale of timber from the forests under the Board of Mines and other authorities, the towns, monasteries and the church.

The gross receipts from the state forests of Olonets, Petrosavodsk and Povenets averaged about 1,500,000 to 1,700,000 roubles annually in the years 1905—1909. This gives an average gross income of 40 kopeks per hectare of the whole forest land, and 60 kopeks per hectare of utilisable forest land. The

average nett income was only about 450,000 roubles, which comes to 11 and 18 kopeks per hectare respectively. It may be mentioned for the sake of comparison that the nett income from the state forests in the province of Viborg in Finland during the same period was 4.50 Finnish marks per hectare of productive forest land, and 2.50 per hectare of the whole forest area. The corresponding figures for the province of Kuopio were 4.20 and 2.— marks.

The receipts from the peasants' forests in these three provinces in the years 1907—08 is given as 1,386,270 roubles in all, or a yearly average of 693,135 roubles.

No figures have been available with regard to the income from private forests or those under the Board of Mines, towns, monasteries, etc.

Prices of wood produce. Until quite recently a tariff drawn up in 1895 was in use for sales from the state forests. This tariff fixed the price of all timber, whether sold by the log, of varying size, or in the mass at the place of cutting. The use of such an antiquated tariff is in itself some evidence of the backwardness of East Carelian forestry, especially in this timber market. The tariff varies with the length of land and water transport. Thus in the province of Olonets for example, for a pine log of 6 vershoks \times 4 sashens (10 $\frac{1}{2}$ inches \times 28 feet) the price varies from 209 kopeks to 233 kopeks, and for a fir log of the same size from 105 to 133 kopeks. According to the same tariff, the price for standing timber is 2.50—6.50 roubles per cord (9.71 cubic metres) of small birch, for pine 2.50—5.50 and for fir 1—3.50 roubles. Competition sometimes raises these prices at the time of purchase, but it often happens that the fixed prices cannot be obtained, and have to be reduced in order that the timber may find a market.

The following were the average prices paid in purchases from the peasants' forests in the years 1902—07;

Average price of logs, in roubles

Province	1902—3		1903—4		1904—5		1095—6		1906—7	
	Fresh timber	Dry firs	Fresh timber	Dry firs	Fresh timber	Dry firs	Fresh timber	Dry firs	Fresh timber	Dry firs
Olonets	—	—	—	—	—	—	0,81	—	0,89	—
Petrosavodsk	—	0,56	—	0,58	—	0,45	—	0,70	1,43	0,52
Povenets . . .	1,80	0,78	1,43	—	1,80	—	0,55	—	1,80	0,18

Average price per cord (9.71 cubic metres) of smaller timber, in roubles.

Province	1902-3		1903-4		1904-5		1905-6		1906-7	
	Fresh timber	Dry firs	Fresh timber	Dry firs	Fresh timber	Dry firs	Fresh timber	Dry firs	Fresh timber	Dry firs
Olonets	—	2,70	—	2,08	—	1,95	—	2,15	6,80	2,28
Petrosavodsk	—	3,15	—	2,73	—	2,56	4,65	3,10	3,83	2,14
Povenets	—	2,40	—	—	—	—	—	—	—	0,88

The prices for the peasants' sales are even lower than those for wood produce from the state forests.

Provinces of Kem and Alexandrovsk in the Government of Archangel

The statements as to the area of the provinces of Kem and Alexandrovsk (Kola) in Russian statistical literature show various discrepancies. According to Strelbitski (1889) the area of the province of Kem, including inland waters and the archipelago, is 49,479 square kilometres, and excluding water 40,588 sq. km. According to N. Mamadishky (1908) on the other hand, the territory excluding water comes to 49,718 sq. km. Planimetric calculations upon our maps, again, show that the area of the province of Kem including water is at least 70,200 sq. km., and excluding water about 62,500 sq. km. It has been impossible to discover from the sources available what are the reasons for the discrepancies. It is however probable that Strelbitski, at any rate, drew the northern boundary of the province of Kem considerably further south than it is now shown on the Russian maps. On some old maps this boundary is marked as running south of the communes of Kieretti, Kouda, Kandalaks and Oulanka. But these communes belong administratively to Kem and not to Alexandrovsk. The area of this latter province is given by Strelbitski, as 155,204 sq. km. including inland waters and archipelago, and excluding them as 148,168. According to Mamadishky this territory, excluding water, would be 145,603 sq. km. On the other hand planimetric measurement on the map gives about 142,300 sq. km. including water (43,000 sq. km. north of the limit of pine and fir trees, and 99,300 sq. km. south of it), and excluding water about 134,800 sq. km.

According to Mamadishky, 4,901,783 hectares of the land area belong to the state, 1,241 hectares to the church, 20,535 to the towns, 415 $\frac{1}{2}$ to the peasant communities, and 33 hectares to factories etc (¹). The land granted to the peasants for reclamation and the forests assigned for cutting of household timber came to 6,671 hectares. According to the same statistics, 14,542,329 hectares in the province of Alexandrovsk (Kola) are held by the state, 88 by the church, 13,312 by monasteries, 2,404 by the towns and 1,907 by the village communities. In addition the peasants have the use of 235 hectares in land for reclamation and forest for household purposes.

Mamadishky states further that out of the 4,901,783 hectares in the province of Kem which belong to the state, 894,211 hectares or 18% is occupied by bog, rock, etc. and that the remaining 4,007,572 hectares (82%) is «utilisable» land, almost all covered with forest. Other sources in the literature of forestry give the amount of utilisable forest land belonging to the state as about 5,000,000 hectares. If we calculate the whole area of state lands from this figure, by applying the percentage above mentioned for utilisable ground, the sum comes in round figures to about 6,100,000 hectares, or appreciably more than the total given by Mamadishky. If to this be added the lands belonging to the church, the towns and the peasants, 70,052 hectares altogether, the total area of the province, excluding water, comes to about 6,170,000 hectares, which approaches the figures already named as the result of planimetric calculation. For the rest, the relation of 82% to 18% between utilisable and waste land cannot be consonant with the fact. Probably the proportions of 60% and 40% correspond more closely to the actual conditions in the province of Kem.

Out of the 14,542,329 hectares of state lands in Kola, Mamadishky gives 10,251,750 hectares or 71% as being bog, rock etc., while 4,290,579 hectares, or 29% are utilisable ground. There are however said to be only 3,170,000 hectares of utilisable *forest land* in Kola south of the limit of pine and fir trees.

The editor of the periodical ЛЬСОПРОМЫШЛЕННИКЪ states in the publication ЛЬСА СЪВЕРА и ихъ главнѣйшія нужды that in the year 1912 the *utilisable* -state forests were divided between the various forestry districts as follows;

District of Sorokka, in the Province of Kem.

Suma Forestry District	.....	384,999 hectares
Sorokka » »	.....	419,133 »
	Total	804,132 hectares

¹) The 29,150 hectares belonging to the Solovets monastery are not included.

District of Kem, in the Province of Kem.

Vuokkiniemi Forestry District	.....	675,526 hectares
Uhtua	» »	591,087 »
Paanajärvi	» »	685,099 »
Kem	» »	1,050,536 »
		Total 3,002,248 hectares

District of Kouta, in the Provinces of Kem and Alexandrovsk (Kola).

Kieretti Forestry District	.....	507,084 hectares
Kouta	» »	504,638 »
Kandalaks	» »	617,296 »
Umba	» »	1,587,925 »
		Total 3,216,943 hectares

District of Kola in the Province of Alexandrovsk.

Kola Forestry District	.....	820,047 hectares
Petchenga	» »	319,417
		Total 1,139,464 hectares

This gives a total of 8,162,787 hectares of utilisable forest.

Russian sources provide much less detailed information about forestry and the forests of Kem and Alexandrovsk in general than is the case with regard to the government of Olonets. The information available mostly applies to the extensive government of Archangel as a whole, not to particular parts of it, and is also very defective. This is no doubt due to the simple fact that no figures based on land survey and calculations are in existence. It is, for instance, instructive to note that out of the whole area of state forests in the province of Archangel, 46,940,189 hectares, only 418,430 hectares had been recorded by the year 1909, and only 2,124,912 had been inspected from a forestry point of view.

There are nevertheless approximate calculations of the quantity of timber in the state forests of these provinces. The timber is in general not so dense as, and shorter than that in Olonets Carelia. The pine is the predominant tree, and further north the fir. In the districts of Sorokka and Kem the average is about 80 cubic metres per hectare of utilisable forest. About 60 % of this is pine, 35 % fir and 5 % deciduous trees. The percentage of timber trees is 25. According to these figures, the quantities of timber in the districts of Sorokka and Kem would be

Pine and fir forests	289,285,000	cubic metres
Deciduous »	15,225,000	» »
	<hr/>	
	Total 304,510,000 cubic metres.	

Timber trees, included above 76,128,000.

If the average size of a timber log is counted as 0.70 cubic metres, there would be about 108,750,000 such trees in the territory.

The forests are still thinner and lower in the districts of Kouta and Kola. Finnish foresters who have visited these regions say that the average amount of timber per hectare of utilisable forest cannot be estimated above 30 cubic metres at most. The fir is here the predominant tree (70 %), while the pine forms 25 and deciduous trees 5 %. Timber trees form about 20 %. According to these figures, the total amount of timber in the district would be

Pine and fir trees	124,157,000	cubic metres,
Deciduous »	6,535,000	» »
	<hr/>	
	Total 130,692,000 cubic metres,	

Timber trees 26,138,000 cubic metres (included above).

According to these calculations, the total amount of timber in the provinces of Kem and Alexandrovsk would come to about 435,000,000 cubic metres, or an average of 35 cubic metres per hectare of utilisable forest land.

Cutting and transport. The hewing, transport and floating in this province are the same as further south in the province of Povenets. Practically nothing but large timber is hewn, though near the sea some props are also cut. Fuel is only cut for the needs of the region itself.

Floating is facilitated by the numerous powerful watercourses which flow into the White Sea. In the district of Sorokka, the timber is mostly conveyed down the Uikujoki and its many tributaries. The chief floating channel in the district of Kem is the Tchirkkakemijoki, and its continuation, the river Kem, which runs into the sea at the town of Kem. The Tchirkkakemijoki is joined at Jyskyjärvi by the great water system of Kuittijärvi, which extends right up to the Finnish frontier. The Ponkamajoki and the Kalkajoki (which runs into Enkijärvi) are also used as floating channels. Kouta district has extensive channels in the south, in the waters of Tuoppajärvi, Pääjärvi and Koutajärvi. This system is also joined by the waters from Oulanka, Paanajärvi and Tuntsajoki from the Finnish side. Nearer the coast there are the waters of Kieretinjärvi and Loukskojejärvi. Further to the north the Nivajoki flows from Imandra to Kandalaks, and at Umba there is

the Umbajoki. The most important floating channels in Kola Lapmark are the Nuortijoki, which rises on the Finnish side, and its continuation the Tuulo-majoki, which runs into the Arctic Ocean at the Kola Fjord.

Here too, as in Olonets Carelia, the hewing, floating and transport form an important source of income for the rural population. Especially of late, since the peddling in Finland carried on by White Sea Carelians has become less remunerative, the inhabitants have taken more and more to forest work.

The sale and export of timber. The sawmills on the White Sea have recently obtained a good supply of timber from White Sea Carelia. There are sawmills working for export in Sorokka, Kem, Kieretti, Kouta and Umba. As noted in the chapter on *Trade and Industry*, the timber export has already reached notable dimensions. The sawmills have, however, chiefly devoted themselves to the working of large timber, so that the chief demand is for logs, while small timber is neglected. The trunks only are taken from the forests, the tops being left to rot.

There is no detailed information available as to the amount of timber cut. The periodical mentioned above states that during the years 1906—1908, the following quantities were taken yearly; in the Suma forestry district, 10 cubic feet per dessiatin of utilisable forest (1 dessiatin = 2.86 acres, or 1.0925 hectares) in the district of Sorokka 6, in Vuokkiniemi 5, in Uhtua 4, in Paana-järvi 2, in Kem 2, in Kieretti 6, in Kouta 9, in Kandalaks 3, in Umba 2, in Kola 4 and in Petchenga 3. On the basis of these annual averages, the total amount of timber hewn would be as shown on p. 209.

These figures are lower than the corresponding ones from the state forests in Finland in the same latitude. Thus, during the same period, the Finnish inspection districts of Uleträsk and Ijo, which border on Kem, furnished an average of 0.40 and 0.28 cubic metres of timber per hectare of productive forest land respectively. In the Finnish state forests which border upon the district of Kouta the average cutting has been between 0.25 and 0.40 cubic metres per hectare.

Proceeds. No special information has been available as to the receipts from the state forests of this portion of the government of Archangel. An article signed И. П. С. under the title Лѣса Сѣвера in the periodical Известий Арханъ. О-ва изученія Русск. Сѣвера (1912), says that the gross receipts from the whole government of Archangel between the years 1906 and 1908 came to an annual average of 8 kopeks per dessiatin of utilisable forest and the nett receipts to 6 kopeks. According to this reckoning, the annual state income from the forests in the provinces of Kem and Alexandrovsk would have been 720,000 roubles gross

Forestry District	Area of Utilisable Forest, in hectares	Average amount cut in the years 1906—8.	
		Total cubic metres of solid timber	Average amount per hectare, in cubic metres
<i>District of Sorokká</i>			
Suma	384,999	99,730	0,26
Sorokka	419,133	65,150	0,16
<i>District of Kem</i>			
Vuokkiniemi	675,526	87,500	0,13
Uhtua	591,087	61,170	0,10
Paanajärvi	685,099	35,500	0,07
Kemi	1,050,536	54,430	0,05
<i>District of Kouta</i>			
Kieretti	507,084	78,820	0,16
Kouta	504,638	117,650	0,23
Kandalax	617,296	47,970	0,08
Umba	1,587,925	82,270	0,05
<i>District of Kola</i>			
Kola	820,047	84,970	0,10
Petchenga	319,417	8,250	0,03
Total and average	8,162,787	823,410	0,10

and 540,000 roubles nett, or 9 kopeks gross per hectare of utilisable land and 6.5 kopeks nett. These figures are obviously based on the information in the annual report of the Russian Department of Forestry, according to which all the state forests in the government of Archangel, comprising 33,559,634 hectares of utilisable forest land, produced in 1906—8 an annual income of about 2,600,000 roubles. The gross income from the provinces of Kem and Alexandrovsk would thus, if calculated according to the area of utilisable land, come to about 700,000 roubles. This result is probably too low, for the income from the extensive state forests of the district of Petchora must be put lower than that from the centres of production on the White Sea and the Gulf of Mesen, and the average is thereby reduced. But in any case it is clear that the state income from these forests, and the price of timber, are very low in proportion to the value of the forests, especially when it is remembered that

the corresponding forests on the Finnish side produce a nett income of Fmk. 0.80—3:— per hectare of productive forest. Even this figure must be considered low, and is due to the small demand.

An idea of the timber production of the provinces of Kem and Alexandrovsk can also be obtained from the statistics of the exports of the coast towns. As stated in the chapter on *Trade and Industry*, the export of wood produce in 1904 was as follows;

Port	Quantity	Value in roubles
Suma	56 tons ⁽¹⁾	296
Sorokka	22,723 »	525,769
Suiku	44 »	292
Kem	17,752 »	410,628
Kieretti	4,786 stds	242,300
Kouta	50,150 tons	1,340,478
Umba	10,710 stds	426,050
total 90,725 tons and 15,496 stds		2,945,813 roubles

As shown above, nearly all the forest land in the province of Kem and Alexandrovsk belongs to the state. It is, therefore, not possible to include in the calculations any private forestry worth mentioning. The wood which the agricultural population needs and cannot obtain from its very small shares in the forest belonging to the village communities, or from the plots leased by the state for cultivation on a forty years' tenancy (an average of 0.13 hectares per homestead in the province of Alexandrovsk and 1.11 hectares in Kem) may be taken from the state forests to a fixed amount per homestead per year.

As the above shows, the forests of East Carelia represent important natural wealth which is still very largely untouched. These forests have been left in peace for thousands of years, the great forest fires alone changing their form or the kinds of tree. The scanty population has not been enough to diminish the stores appreciably, except in the regions near the centres of consumption in the south. It is only during the last few decades that the wood produce industry has begun to exploit these resources, and it is still in the earliest stage of development.

The present is, however, a critical period even with regard to the forest

⁽¹⁾ One metric ton = 1,000 kilogrammes = 0.9844 English tons.

resources of East Carelia. The timber trade has already received an impetus on the coast of the White Sea. Business men are devoting more and more attention to the treasures of the forests near the coast, and the new Murman railway has made it easier than it used to be to transport machinery and other means of production to these regions so rich in raw material. As soon as the war comes to an end and normal conditions return, much greater enterprise may be expected in the wood industry.

Much remains to be done however, especially in the improvement of transport and means of communication in East Carelia, before the forest industry can reach a point of development worthy of the value of the forests. The timber floating channels must be improved, roads must be built and railways laid in suitable places, so as to provide a means of disposing also of the smaller timber. Only then can the forest capital be expected to yield the rent and the income suggested above, and only then will the forests receive real care.

ONNI LÖNNROTH.

3. Fish and Fishing.

A. The White Sea.

The fish in the White Sea comprise about forty species, of which the most important are the herring or *selt*, sea salmon and navaga. The salmon-trout (taimen), cod and flounder come next, and the vendace or White Sea smelt and polar cod also have some importance.

Salmon fishing is the most important on the Ter Coast from Ponoï to Kandalaks. In the villages near Kandalaks herring fishing comes first, and salmon takes the second place. On the coast of the Gulf of Onega herring and navaga are the main catch.

Herring fishing. The White Sea herring (*Clupea harengus*) is known to the Finnish peasantry by its Russian name «selt», and is just as peculiar to this inland sea as the «strömming» is to the Baltic. It differs from the ocean herring both in its smaller size and in flavour. This is specially true of the herring caught in the shallow Gulf of Onega, from whence come the greater part of the White Sea herring in commerce. According to *Aleyiev*, a large herring from the Gulf of Onega is about $17\frac{1}{2}$ —18 centimetres long, a medium one $14\frac{1}{2}$, and the smaller fish sold about $12\frac{1}{2}$ centimetres. The White Sea herring is generally of excellent flavour, whether used fresh or salted, provided

that good salt is used in salting, and the care and cleanliness are observed which are necessary to the production of good preserves.

There is very extensive herring fishing at Sorokka. The fish are caught here late in the autumn, from the beginning of November, when the water is still open. As many as five or six hundred boats may then be seen at work in the Gulf of Sorokka, two to each net. Later on, the fish are caught under the ice. At this season the fish approach the coast in dense shoals, pursued by gulls and seals; the appearance of the latter always shows that herring are near. The shoals are so dense that the fisherman in his boat can feel with a pole where the fish are; he can similarly find out whether they are herring or smelt, for shoals of the latter do not feel so dense and vigorous as the former. As soon as a shoal of herring is discovered the seine is thrown out into the water. If the catch is small, only two or three horse loads, it is drawn into the boat, but a richer catch is dragged back to land or the edge of the ice. This net (seine) is only used near the shore, and in water less than two fathoms deep.

The seine used in herring fishing is twelve to fourteen foot deep, its bag is four fathoms long and the arms fifteen fathoms. In fishing under the ice either the seine is used or the junket, which is really intended for catching navaga.

In the absence of cold storage establishments, the price of the fish is very variable (about 50 kopeks to 4 roubles per 1,000), and depends upon the weather. The fish are spread out on the ice immediately they are caught, so as to get thoroughly frozen, and then gathered into heaps. There is no question of salting or otherwise preserving them.

The following figures show the annual catch of herring at Sorokka;

Year 1906	.....	1,200,000 kg.
» 1907	.....	78,400 »
» 1908	.....	59,200 »
» 1910	.....	4,800,000 »

In the deepest bay of the White Sea, the Gulf of Kandalaks, herring are caught in the spring and early summer as well as in the autumn and beginning of the winter. The most important fishing is at the villages of Kandalaks, Knjäsa, Kouta, Mustajoki and Kieretti, in April and May, under the ice. Fishing is also carried on to a less extent after the ice melts, and again for a short time after midsummer. The autumn fishing begins at the end of August or in September, and lasts till November, when the sea freezes.

The fishermen state that the Kandalaks herring are generally larger than those from other parts of the White Sea. 1,000 fish from Kandalaks weigh 160

kg., but 1,000 from Sorokka only 40 kg. The fish caught under the ice in April and May are smaller, being young spawning fish, than those which make their way to the coastal waters after the ice melts. The autumn herring are considerably larger and fatter, and obtain a higher price. The seine used is generally 50—60 or 80 fathoms long, and 4—6 fathoms deep. A single net takes about 2,800—3,200 kg. of fish at Kouta in the April fishery, or in a good catch as much as 8,000—9,000 kg. The fish are salted in the most primitive fashion in small barrels called »botsenka», each of which holds about 7—10 kg., or 250—300 fish. The amount of salt used is about 2—3 kg. The same nets are used as in the spring fishing. Each net is worked by two boats, each with a crew of three or four men. The catch is smaller than in the spring, partly because a number of the fishermen are still away at the summer fishing on the Murman Coast, and partly because of difficulties due to the ice.

According to Rosov (1913), whose calculations seem to be comparatively reliable, the annual catch of herring amounts to an average of 155,000—180,000 barrels. The same writer estimates the number of nets in the communes of Kandalaks, Knjása, Kouta, Mustajoki and Kieretti at five hundred.

Most of the salt herring is sent to Archangel, but the Carelians in the interior also use a good deal, and give potatoes, grain, etc. in exchange. From Kieretti for example about 12,000—15,000 barrels are sold annually, and from Mustajoki about 4,000.

The statistical information concerning the herring fishery of the White Sea as a whole, and regarding the fisheries in general, appears to be far from reliable, and must therefore be used with caution. The contradictions in the statistics are partly to be explained by the fact that different publications include larger or smaller areas in the White Sea fishery. According to the statistical bulletins issued by the »Internationa Mar Investigation» the following quantities of herring have been obtained from the White Sea;

Year 1903	.....	2,647,264 kg.
» 1904	.....	116,464 »
» 1905	.....	324,416 »
» 1906	.....	3,423,808 »
» 1907	.....	1,412,368 »
» 1908	.....	897,328 »
» 1909	.....	942,960 »
» 1910	.....	7,133,984 »

According to L. Finstad the catches of herring in 1912—14 were as follows;

Year 1912	4,638,000 kg.
» 1913	3,074,176 »
» 1914	1,416,144 »

The same writer shows the catch of the last mentioned year divided between the various provinces as below;

Alexandrovsk	129,104
Kem	1,019,360
Onega	43,040
Archangel	224,540

Salmon Fishing. After herring, salmon take the chief place in the White Sea fishery. The chief catch is the sea salmon (*Salmo salar*); salmon trout or grey salmon (*Salmo trutta*) are also caught, but to a less extent. The fishing mostly takes place at the mouths of the streams and rivers up which the salmon go to breed, and on the seacoasts. The salmon fishing begins when the ice melts, generally in May, and continues all the summer till the beginning of the autumn, or till the winter. In the river Kem, and at a couple of other places on the White Sea coast, the autumn is the most favourable season.

As already mentioned, the salmon fishing is the most remunerative in all the villages on the south coast of Kola, from Ponoï to Umba. Salmon are also caught off the Solovets islands, where there is abundance of fish of all kinds. At Ponoï and Varzuga, salmon are caught almost exclusively in the rivers on which these villages are situated, but otherwise, and especially on the Ter Coast, salmon fishing is carried on as actively on the sea-coast as in the rivers.

Fixed and movable sweep-nets are used, including draw-nets, and, in the rivers, salmon traps.

The average catch of salmon at Kandalaks and on the adjacent coast is estimated at 57,600 kg., divided as follows between the different communes; Kuzomen 16,000, Umba 24,000, Kandalaks 1,600, Knjása, 1,600, Kouta 8,000, Kieretti 4,800, and Ponkama 1,600. According to another estimate, the annual catch in the first ten years of the present century only averaged 1,900 kg. in Kouta, and 1,200 (spring salmon) at Mustajoki. According to Alexeyeff 44,800 kg. were taken in the Ponoï river in the year 1909, 32,900 kg. at Varzuga in the same year, and 19,200 kg. at Umba. Salmon go as high up the Kem river

as Paanajärvi and occasionally higher, and there are many salmon fishing places on this river, but there are no particulars of the size of the catch in the sources available. According to one statement, 3,400 kg. were taken at Paanajärvi in 1910, 2,200 kg. at Usmana and 17,300 kg. at Uikujoki.

The quantity of salmon trout caught in addition to the salmon is generally not more than enough for local needs, but Kouta, for example, supplies about 500 kg. a year to commerce.

The annual catch of salmon and salmon trout in the White Sea is estimated to average 320,000—480,000 kg. The above mentioned statistical bulletins give the following as the quantities of salmon and grey salmon caught in the White Sea in the years 1903—10.

Year	Kilogrammes.
1903	189,072
1904	311,360
1905	490,192
1906	479,472
1907	507,488
1908	569,152
1909	544,464
1910	479,568

The average for the period was 446,300 kg. per year, which corresponds very well to the figures given above.

Cod and navaga fishing. The White Sea produces not only the ordinary cod (*Gadus morrhua*), but also two small arctic species, the navaga (*Gadus navaga*) and the polar cod (*Gadus saida*). The former is caught chiefly on the Kandalaks coast, as in the bays of Knjäsa, Kouta and Mustajoki, where a smaller quantity of polar cod is also said to be taken. *Rosov* gives the annual catch of cod at Kouta and Mustajoki as about 112,000—128,000 kg., or about 600—700 kg. for each family in these villages.

The navaga is more important than the cod or polar cod to the population round the White Sea. It is a small fish, 15—30 centimetres long, with rather a good flavour. Considerable numbers of this species are caught in the Gulf of Onega. Here the autumn is the best fishing season. As soon as the ice is strong enough to bear a man the navaga fishing begins, and it continues until Christmas, when the fish make their way to deeper waters to breed. In January or February, after spawning, they reappear on the coast, but the fishing is not then so active as in the autumn. The net most used is a long

narrow junket with three bags, the mouth of which is 1 ft. 3 in. — 4 ft. 8 in. high, and has a guiding arm on each side. On the Kem Coast, between the Ruegijoki and the Viremajoki, and especially in the shallow bays where the bottom is exposed at low tide, a kind of junket made of a close netting is also used. The navaga are also caught everywhere with hook and line, especially by women. The women go out on the ice at high tide, cut a hole and begin to fish. The tackle is a short rod with a line, to which is fastened a three cornered bit of lead with snoods for the hooks. Dried sea-worms (*Arenicola marina*) are used as bait. *Aleyeff* says that a skilful angler can catch 30—40 navaga in half an hour. Angling is the most ancient method of fishing. The junkets have come more and more into use during recent decades, and angling is now only used for household requirements.

Navaga are sold by the 1,000. The weight of a thousand varies, according to the size of the fish, and averages 64—80 kg. (Small navaga, weighing 30—60 kg. per 1,000 are caught in the bays of Unskaja and Lahtala; the biggest fish come from near the village of Koleshma, where the same number weigh 90—100 kg.).

The price of fresh navaga varies with the season. It is high in cold weather, but sinks when there is a thaw. In the year 1912 navaga usually cost one kopek each at the place of catching. When sold in commerce they are almost invariably frozen.

According to Russian information in the bulletins of the International Marine Investigation, the following were the total quantities of navaga caught in the White Sea in the years 1903—10

Year	Kilogrammes
1903	980,680
1904	860,480
1905	1,262,720
1906	2,055,776
1907	1,628,656
1908	1,579,360
1909	1,293,392
1910	1,675,184

Thus the average annual catch during the period taken was 1,417,000 kg.

With regard to the quantities of navaga caught in the different districts, it may be mentioned that according to *L. Finstad*, the following were the takings in 1913.

Province of Kem	272,880 kg.
» » Onega	104,000 »
» » Archangel	194,400 »

Flounder, vendace and smelt fishing. The flounder is caught everywhere, but as a rule only for household needs. In addition to the ordinary flounder (*Pleuronectes flesus*) the White Sea produces the Dvina flounder (*Pleuronectes dvinensis*), a less valuable species, and the plaice (*Pleuronectes platessa*)

A certain amount of vendace (*Coregonus lavaretus*) is caught at Kandalaks, Kouta, Kalkalahti and Ponkama, etc. So too, the smelt (*Osmerus eperlanus*, v. *Dvinensis*) is taken at the mouths of rivers and streams, but at the breeding season, after the ice melts in the spring, this fish departs to fresh water.

Extent and pecuniary value of the fishing. The above mentioned international bulletins give the following statements of the fish of all kinds caught in the White Sea.

Year	Amount in kg.	Value in German marks.
1909	3,570,272	1,530,419
1910	9,872,208	3,134,342

Marine mammals may be dealt with in connection with the fishing.

Sealing. Much sealing is carried on by the coast population round the White Sea. The ringed seal (*Phoca setida*) is the chief quarry, and in the eastern parts also the Greenland seal (*Phoca grænlandica*) and the bearded seal (*Erignathus barbatus*). The Greenland seal is a migrant, which in the autumn leaves the Arctic Ocean in large schools and comes to the mouth and eastern coast of the White Sea, in order to pass the winter there and to breed; in March or April it returns to the Arctic Ocean with the drift ice in great herds, or goes further westwards along the Murman Coast. The mouth of the Ponoï is a good hunting ground, but numbers of seals are killed all along the Ter Coast, from Sviatoinos to the mouth of the Varzuga, as well as in the Gulfs of Dvina and Onega. In the inner parts of the White Sea the ringed seal are the chief quarry, though bearded seal are also killed. According to information given, a total of 639 seals were killed between 1903 and 1911 at Kouta, Knjasa and Mustalahti, or an average of 71 each year. They are sometimes hunted with firearms, usually old military rifles, and sometimes with nets; a good many seals and cubs are also killed with clubs. Only the blubber and skins of the seals killed is utilised.

The following statistics from the parts of the White Sea nearest to Finland,

the districts of Kem and Onega, for the years 1900—1904, are quoted from a table compiled by Prof. KNIPOVITSCH;

Year	Number of sealers		Seals killed		Total value of the quarry in roubles
	District of Kem	District of Onega	District of Kem	District of Onega	
1900	114	104	2,798	942	7,590
1901	108	125	1,927	1,185	8,864
1902	264	105	3,315	973	10,882
1903	100	104	1,325	898	6,430
1904	194	121	425	807	9,332

B. The Inland Waters.

The fish in the inland waters. The fish in the inland waters of East Carelia and Kola Lapmark are much the same as those in about the same latitude on the Finnish side of the frontier. Some of the migratory fish from the White Sea which come up the rivers debouching in that sea, are distinguished as geographical varieties from the corresponding species in the Baltic (Gulf of Finland and Gulf of Bothnia), such as the White Sea smelt (*Osmerus eperlanus v. dvinensis*) and the river lamprey (*Lampetra fluviatilis v. japonica*) in the Uikujoki. Only on the outskirts of the territory do there appear fish peculiar to Russia, such as the nelma, a northern species of vendace (*Stenodus leucichthys nelma*) in the river Onega, and the sterlett (*Acipenser ruthenus*) in the Dvina.

As elsewhere in Fennoscandia, the various species of the salmon family which breed in the autumn, are comparatively numerous among the fresh water fish. The migratory fish named above, the sea salmon »sjomga» (*Salmo salar*) and the grey salmon »kumsha» (*Salmo trutta*) mount all the rivers which flow into the White Sea (the Ponoï, Varzuga, Umba, Kem, etc.) The salmon which occurs in Lake Ladoga is held to be a shut in (relict) form of sea salmon (*Salmo salar v. relict*a). The »big salmon» of lakes Tuoppajärvi, Pääjärvi and Ala-Kuittijärvi are possibly also »relict» sea salmon which have been cut off from the sea. The fish of the salmon tribe which is most widely distributed in the lakes is the lake trout (*Salmo trutta lacustris*) found in Ladoga, Onega, Voijärvi, Ohtajärvi and Pistojarvi, as well as various other lakes. The river trout (*Salmo trutta vario*) is found in rivers and the smaller lakes of the tundras

The char (*Salmo alpinus* v. *salvelinus*) occurs in the lakes of the Kouta water system, Paanajärvi, Kuittijärvi, Ladoga and Onega and their neighbourhood, Päljärvi, Seesjärvi and Jolmajärvi. The grayling (*Thymallus thymallus*) is common in running water, especially in the Kem and Tchirkkemi rivers. The vendace family is distributed over all the rivers and lakes, the common vendace (*Coregonus lavaretus*) being the most usual. Lakes Ladoga and Onega also contain a number of other species, such as the valamka (*Coregonus Widegreni*), the Svir vendace (*Coregonus baeri*), etc. The bleak (*Coregonus albula*) and the small lake smelt (*Osmerus eperlanus* v. *spirinchus*) are found as far north as White Sea Carelia.

The pike (*Esox lucius*) occurs even in the lakes of Lapland, as well as the perch (*Perca fluviatilis*) and the burbot (*Lota lota*); the roach (*Leuciscus rutilus*) and ide (*Leuciscus idus*) are also common. The dace (*Leuciscus grislagine*) lives in the Kem river and various other waters; the bream (*Abramis brama*) and pike-perch (*Lucioperca sandra*) begin to appear south of that river, but are only of importance in Ladoga and Onega and elsewhere in southern Olonets Carelia.

The eel (*Anguilla vulgaris*), the river lamprey (*Lampetra fluviatilis*) and occasionally the sea sturgeon (*Acipenser sturio*) as well as the salmon (?), mount the Neva to Lake Ladoga.

Species peculiar to the south east, which probably came to this country during the Ancylos period from the Aral-Caspian region, are found, many of them in abundance, in the shallows of south Ladoga, the rivers which fall into it (the Olhov and Sjas) and to some extent also in the Svir and Neva. These include the chub, (*Leuciscus cephalus*), the pelecus (*Pelecus cultratus*), the aspilus (*Aspius rapax*), and the abramis (*Abramis vimba* and *Abramis ballerus*). The pike-perch, although more widely distributed, must be assigned to the same group. A few sheat-fish (*Silurius glanis*) are found in these regions, as well as in the Suojärvi water system, which falls into lake Onega. The tench (*Tinca tinca*) is of very local distribution; the most northerly place where it is found is said to be Kelljärvi, near the village of Tiudie. The sterlett (*Acipenser ruthenus*) is a later arrival found in the basin of Ladoga and Onega.

The fisheries. Owing to the numerous large lakes, fishing is of great importance to the economy of the inhabitants, especially as agriculture and cattle breeding stand so low. As is natural, fishing is mostly carried on for household needs, and, according to the place and season, the chief catches are pike, bleak, vendace, perch, roach, ide, bream, burbot, smelt, grayling, salmon and grey salmon. Fish is a very important article of food all the year round.

Some fresh water fish, especially vendace, salmon, grey salmon, bleak, pike and charr, are also sold commercially. They are conveyed fresh, salted, dried (pike) or in the winter, frozen. The chief places of sale are Archangel, and for the Olonets fish, Petrosavodsk and Petrograd. A good deal of fish is exported from Suma. In the year 1908, 10,766 kg. of fresh fish (value, 7,536 Finnish marks) and 1,569 kg. of salt fish (value 1,188 Finnish marks) were exported to Finland via Salmis.

Finnish travellers say that fish are very abundant in the lakes and rivers on the other side of the frontier. Thus ROSBERG, in his work on the distribution of fish in Russian Carelia (1891), says that there is greater abundance of fish than in the corresponding latitudes of Finland. »Fishing is in East Carelia» writes one author (Karjalan kirja III page 73) »a very remunerative occupation, for the lakes are exceptionally full of fish, in spite of the thoroughly unscientific way in which fishing is carried on, especially at the breeding season. The only pity is that too much fish is always taken, so that the surplus cannot be sold and must be left unsalted or, which is still worse, be allowed to rot after salting.» This extract in itself shows that the fishery leaves much to be desired from the point of view of wise economy. The great abundance of fish in extensive regions especially of White Sea Carelia is explicable by the thinness of the population. The injurious methods of fishing have not been able to do as much harm here as in more thickly populated districts. ROSBERG has already remarked that small or moderate sized lakes on which a large village is situated are generally comparatively poor in fish.

Even in lakes so large as Onega, the proceeds from vendace and other fishing seem to have considerably declined. PUSHKAREV calculates (1913) that the vendace fishing has declined all over this lake during the present century, in places by as much as one third, that in the southern parts the bleak fishing has almost come to a standstill, and that salmon netting, which used to furnish the population with about 30,000 roubles additional income every autumn has almost been abandoned on the west coast, and has at other places diminished by half; the char fishing in Jalguba has also perceptibly declined. The same Russian fishery official states that between the years 1895 and 1900 about 1,280,000 kg. of fish came annually into commerce from Lake Onega, but in 1912 only 800,000 kg. The monetary value used to be as much as 200,000 roubles, but in 1912, in spite of a considerable rise in prices, it was only 146,000 roubles. (1)

(1) It may be mentioned for the sake of comparison that the amount of fish exported in 1913 from the Finnish part of Lake Ladoga to Petrograd, by

The case seems to be the same in other waters where fishing is actively carried on. JAKOBSON (1911) states, for example, that at the beginning of this century the Paanajärvi fishermen on the river Kem took 19,200 kg. of salmon (1,280 kg. per boat) annually, that in 1906 they took 11,200 kg., in 1908 5,600 kg., and in 1910 only 3,600 kg. (240 kg. per boat) He says that old people talk of the times when the catch was as much as 2,400 kg. (150 poods) per boat.

Even, therefore, if the fish may still be considered very abundant in the waters of thinly populated areas, the general course of things yet shows, as suggested particularly by the decline in the fishing industry of Lake Onega, that the time has come to conduct the fisheries on a more scientific system than has hitherto been adopted. There is great encouragement for such action in the great possibilities of increasing the profit from fishing afforded by the wealth of lakes in Olonets and elsewhere in East Carelia.

It was only during the last decade that the Russian fishery officials began to pay much attention to the study of fishing and to work for the improvement of this industry in East Carelia. It has been proposed that a large fish-breeding establishment should be started at Petrosavodsk for the preservation and increase of the valuable species found in Lake Onega and the surrounding waters. The originator of the proposal thought the establishment ought to be able to receive each year twenty five million grains of spawn, namely twenty million vendace eggs, four million salmon and trout, and one million char. A salmon breeding establishment was to be started on the Neva. There have also been proposals for securing a sufficient stock of fish in waters which have been impoverished by the presence of predatory species, but owing to the war none of these proposals have been carried out.

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4 Game and Hunting.

Although there has been no preservation of game in East Carelia and no organisation of the hunting, yet, owing to the paucity of population, game is still so abundant that the people could until recently obtain a considerable addition to their incomes from trapping. According to the official statistics, there were in 1904 about 800 trappers in the province of Kem, and in the years 1898—1909 an average of about 4,300 in

rail, water or road, came to 352,000 kg., equivalent at the then prices to a value of about 520,000 marks.

the provinces of Olonets, Petrosavodsk and Povenets, but these figures are probably much too low. L. BLAGOVESTCHENSKI (1911) who describes the conditions of hunting in the government of Olonets, conjectures that from one twelfth to one tenth of the whole population hunts as a subsidiary occupation.

In order to reduce the immoderate slaughter of useful game, the Game Law of 1892 forbade the use of the gin. Nevertheless, this destructive kind of trap is still used in the extensive wilds where the observance of the law is not enforced; sea-fowl, ducks, geese and swans are also trapped during the spring migrations, etc. Some limitation of the all too extensive pursuit of game is also contemplated by the provision that at least in the government of Olonets hunting rights may only be granted on the payment of a yearly fee of one or two roubles. The fee for elk hunting is ten roubles per year, or three roubles a time. The income from this tax in the said government is about 35,000 roubles yearly.

The usual game are, among mammals the hare, wild reindeer and elk, and among birds the hazel hen, ptarmigan, black-cock, capercaillie, duck, to some extent also geese and swans, and in the southern parts also partridges, woodcock and snipe. The chief quarry are the hazel-hen, hare and capercaillie. The wild reindeer, already extinct in Finland, is also disappearing on the other side of the frontier. Elk are also beginning to be scarce.

Furred animals, particularly the squirrel, are also of great importance to the professional hunter in Carelia, as will be seen from the tables. The numerous beasts of prey which are hunted are the bear, wolf, fox, marten, lynx, weasel, otter and wolverine, in the province of Kem also the arctic fox, and in Olonets the mink, polecat and badger.

The frequency of the larger beasts of prey, the wolf and bear, even in the present century, is significant. They have, however, always been energetically persecuted, and especially so during recent decades, since old military rifles have found their way over the country side.

In order to show the proceeds of the hunting, we quote here some statistics which we have gathered, from the available sources.

1. Province of Kem, 1904.

Bear	26
Wolves	0
Wolverine	6
Fox	95
Marten	170

Arctic fox	45	
Weasel	252	
Squirrel	5,360	
Other mammals	142	
Hazel-hen	27,090	brace
Ptarmigan	4,310	»
Capercaillie	7,328	»
Other forest and water fowl	8,120	»

Total furred animals, 6,086, calculated to be worth 2,956 roubles. Total birds, 46,848 brace, calculated to be worth 7,163 roubles. Total value of the quarry 10,119 roubles.

Number of hunters, 885.

Squirrels cost ten kopeks each on the spot, and a brace of ptarmigan an average of twenty-six kopeks.

2. The Russian writer mentioned above says that the average numbers killed per year in the first eight years of the present century in the government of Olonets were as follows; Bear 249, wolves 115, fox 534, marten 914, hare 17,008, squirrel 105,674, a total of 124,494 animals, at a value of 30,667 roubles; of birds, hazel-hen, 67,385 brace, ptarmigan 8,488, other birds 29,414, a total of 105,286 brace at a value of 39,200 roubles. The average total value of the quarry amounted to 69,867 roubles. The average number of hunters in the years 1898—1909 was 10,000, 4,000 of them in the provinces of Olonets, Petrosavodsk and Povenets.

3. Statistics of the Government of Olonets, 1912.

	Number	Value in roubles
Elk	42	358
Hare	20,953	3,351
Squirrel	52,106	10,600
Bear	139	3,215
Wolf	149	1,012
Wolverine	10	120
Lynx	77	1,274
Fox	786	9,739
Marten	547	5,879
Polecat	337	754
Weasel	1,111	2,325

Otter	36	244
Mink	217	361
Badger	10	25
Caper-cailzie	9,916	5,213
Black-game	15,300	6,749
Hazel-hen	78,527	16,884
Ptarmigan	8,719	1,395
Partridge	3,162	640
Duck	7,998	1,408
Goose	432	401
Swan	64	38
Loon	40	16
Snipe	300	38
Sundry	320	32

Total of furred animals, 76,520, worth according to local prices 39,257 roubles. Total birds 124,778 (62,389 brace) worth according to the local prices 32,814 roubles.

The following were the prices on the spot in 1912; ptarmigan 15—20 kopeks, duck 18—20 kop., partridge 21—23 kop., black-cock 40—50 kop., capercailzie 45—65 kop., hare 13—17 kop., squirrel skins 18—23 kop., weasel skins 1. 40—2. 30 roubles, wolf skin 5—8 roubles, otter skin 5. 60, elk skin 8 roubles, marten skin 9—13 roubles, fox 11—13, wolverine 12, lynx 12. 45—16. 90, and bear skin 18—25 roubles.

The trade in forest game is of considerable dimensions. Sunku is the most important centre of the fur-trade and the trade in forest game in general; numerous dealers from distant parts come to its market. Squirrel skins are mostly bought in Kargopol, where a large number of persons are employed in curing them. Otherwise the produce mostly makes its way to Petrograd.

The stock of game has considerably diminished owing to the absence of any protection, and the general unscientific methods. Olonets is obviously progressing in the same direction as Finnish Carelia, where hunting is no longer pursued as a livelihood, and in Kem Carelia, where the complaint has long been heard that owing to the excessive hunting the game has begun to diminish. If hunting is allowed as an unrestricted means of livelihood, it always leads to a diminution of the stock of game, and the destruction of the more valuable species.

Generally speaking, the causes of a diminution of game are nearly always manifold, and vary in different countries, but they need not, as many believe,



Fig. 53. Town of Petrosavodsk.

Photo *A. O. Kihlman.*



Fig. 54. Town of Povenets.

Photo *W. Ramsay.*





always be looked for in «civilisation». This is proved by the large stock of valuable game in countries as thickly populated as Germany and Austria (thirty million kilogrammes are killed annually). Neither is the presence of large numbers of beasts of prey the only cause, for about 1860, when there were certainly no less beasts of prey, large and small, in Olonets than there are now, about a million brace of birds and 200,000—300,000 squirrel and other skins were sent to the Sunku market from the surrounding governments (according to Rybnikoff). Moreover Finland, which must now be considered as really poor in forest game, is almost devoid of all the larger beasts of prey. The hunting must be organised and supervised. Unless the enlightened sections of the population and the government realise that the preservation and reasonable protection of useful game is a matter of public and of economic importance, there is a danger that this inherited wealth of natural resources will not only yield little interest, but will decline until in time it becomes quite insignificant.

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5. Trade and Industry.

Provinces of Olonets, Petrosavodsk and Povenets in the Government of Olonets.

Since very ancient times trade has been one of the most important sources of livelihood for the inhabitants of the government of Olonets. Its position on the isthmus between the White Sea and Ladoga and Onega have made it the natural channel of traffic between the sea coast and the more thickly populated regions to the south. It was the transit trade, together with the abundance of forest game and fish, which led to the first settlements here, and it has also more recently done much to assist the increase of population and the possibilities of livelihood.

The pogost ⁽¹⁾ of Olonets is mentioned as early as 1137 among the Novgorodian territories which took a notable part in the Hansa commerce of those days. The old Novgorodian line of commerce went along the river Volkhov to Ladoga, thence to Lake Onega and on to the White Sea. The pogost of Sunku on the north-west shore of Lake Onega existed in the thirteenth century, and the neighbouring pogost of Tulvoja is also mentioned. The village of Suoja on the west shore of Lake Onega is given as the centre of traffic for these pog-

(1) The pogost is an ancient rural taxation district in Russia.

osts, and the population of the village is said to live chiefly by fishing and the fish trade. The village of Povenets is first mentioned in 1680, in the time of Ivan the Terrible.

Modern traffic between the provinces of Olonets, Petrosavodsk and Povenets and the cities of Petrograd, Novgorod, Rybinsk, Jaroslav, Kostroma, Vologda and other trade centres further south, makes most use of the waterways, the rivers and canals. The excellent traffic channel from Petrograd up the Neva to Nöteborg continues along Ladoga to the mouth of the Svir and then up that river to Lake Onega. The great canals of Alexander II., Peter the Great, Maria Feodorovna, Catherine II., Alexander III. and the Svir, south of Ladoga, do much to facilitate traffic, especially for barges. The much used waterway of the Olkhov, flows from Lake Ilmen and the neighbourhood of Novgorod and also debouches in Lake Ladoga. The so-called Tihvin waterway also flows into Lake Ladoga, by the Pasha river. From Rybinsk, Jaroslav and Kostroma the traffic makes its way up the Sheksna, a tributary of the Volga, to Bielozersk on Lake Bielozero, thence by the Bielozersk canal to the river Kovsha, which again is united by the Maria canal with the river Vytegra, which runs into Lake Onega. The traffic between the Vytegra and the Svir goes both along the southern part of Lake Onega and (mainly) by the Onega canal, which unites the mouth of the Vytegra with the Svir at Vosnesenja market. The old lines of transport cross Lake Onega northwards; from the Svir to the town of Petrosavodsk, to the mouth of the Vodlajoki, to the port of Kuzeranta, to Sunku market and to the town of Povenets, whence an old high road leads to the little market town of Suma on the White Sea.

The most important centres of commerce are now Vosnesenia wharf, where the Svir leaves Lake Onega, and the town of Petrosavodsk. Very extensive transshipment takes place at Vosnesenia, which place has also become a centre for the storage of the grain sent to these regions by the wholesale dealers of Rybinsk, Kostroma, etc. Petrosavodsk (Fig. 53) is the largest trade centre in the province. During the summer there is lively steamboat traffic in the town. Boats run three times a week on the line between Petrograd and Petrosavodsk, and regular communication has also been established with Vosnesenia, Povenets and Pudosh. There has been a cannon and ammunition factory in the town ever since the eighteenth century. The merchants of Petrosavodsk import grain, groceries, agricultural produce, beverages and medical requisites, and export wood produce, fish, forest game, iron goods, etc. In 1913 Petrosavodsk was connected with Petrograd by railway, and in 1915-16 this railroad was extended up to the Murman Coast. The town of

Povenets (Fig. 54) lies on a northern arm of Lake Onega, and deserves mention as serving the transit trade. Fish, wood produce, etc. are sent from the north via this town to Petrograd and other centres of consumption, while grain and groceries are transported in the contrary direction. Olonets, the third town of East Carelia, situated at the confluence of the Olonka and Mägri rivers, has sunk into insignificance as a place of traffic. Its brightest period was in the seventeenth century, when its citizens made trading expeditions even as far as Stockholm. Nowadays the town is scarcely distinguishable from the surrounding villages.

It is difficult to obtain reliable, and especially comparable and useful figures of the trade and industry of the territory. The Russian statistical publications and the reports of the zemstvos remark on the disinclination of the various merchants, shipping agents and factory owners to give complete information about their businesses. The statistical material is therefore varied and uneven. While the figures for some districts are fairly complete, they may be entirely wanting for a neighbouring area, so that we must here be content with general assumptions. The following description is based on the publications of the Russian Ministry of Finance, the reports of the zemstvos and special statistical yearbooks, and makes an attempt to group the information according to the different branches of trade and industry.

Grain. As shown in the chapter on that subject, agriculture is still at a primitive stage, and insufficient to feed the population from one harvest to another. The country is therefore obliged to rely on imported grain, the obtaining and transport of which has become one of the most important cares of the population. Not only individual merchants but also representatives of the government and of the zemstvos are engaged in securing grain. The provinces, towns, communes, and in places even the villages have their own food funds for this purpose. The zemstvo of the province of Povenets is mentioned as being especially active, and obtains grain also for the communes further north. The difficulties of transport, and the responsibility, are best seen when one remembers that 89% of the population of Povenets has no road practicable for wheeled traffic, while 45% has not even paths.

The grain (rye, wheat and oats) comes from the south, mostly during the summer, by the waterways from Jaroslav, Vologda and Rybinsk, some also from the neighbourhood of Moscow and Riazan, Kama, Viatka and Saratov. Some corn is transported by high road in the winter, some of it also from Finland. Grain for the whole year is bought at the end of July and beginning of August, and is therefore then a year old. The transport between Rybinsk and Vosnesenia takes 18–30 days, according to the weather, that between

Vosnesenia and Povenets 2—3 days. The transport from Vosnesenia down the Svir to the region of Lodenoye polie and the mouth of the Svir takes as much as a fortnight, as the barges are collected into groups of twenty or thirty and gradually moved on.

The figures of the annual grain import are incomplete. According to the information of the Russian Finance Ministry, a total of 7,690,400 kg. of grain was imported in 1900 to the town of Petrosavodsk, Kontupohja, Munjärvi, Suurlahti, Tulvoja and Suoju communes in the province of Petrosavodsk, and to the communes of Mäntyselkä and Sunku in the province of Povenets. This included

5,077,800	kg. rye flour
737,100	♦ rye
819,000	♦ wheat flour
491,400	♦ wheat
327,600	♦ oats, and
237,500	♦ other grain.

With regard to the other communes in the province of Povenets, it can only be said that in 1900 grain was imported to a value of 270,000 roubles, which at the prices then prevailing represented about three million kilogrammes. Part of this grain was sent on northward to the communes in the province of Kem in the government of Archangel.

No details are available about the importation of grain into the province of Olonets. It is, however, stated that in the year 1900 a total of 47,010,600 kg. of grain was transported to the wharfs on the two sides of the Svir, and that this included

34,889,400	kg. rye flour,
6,060,600	♦ rye,
2,293,200	♦ wheat flour,
1,310,400	♦ wheat,
2,129,400	♦ oats, and
327,600	♦ other grain.

It is obvious that the greater part of this large quantity of grain shipped to places on the Svir was transit goods on its way to the communes in the province of Olonets, the southern parts of the province of Petrosavodsk, and to some places in the provinces of Lodenoyepolie and New Ladoga. It is specially

mentioned that about 4,914,000 kg. out of the above was intended for the coast of Ladoga, and partly for Finland. The grain for Finland is clearly part of the consignments which pass every year through the Finnish custom stations at Virtelä, Käsänaselkä, Kokkonieniemi and Leppäniemi. Finland imported via these stations 68,615 kg. in 1912, 36,704 kg. in 1913, 257,940 kg. in 1914 and 212,715 kg. in 1915.

It may further be remarked that the communes of Repola, Rukajärvi and Paadene in the north of the province of Povenets draw some of their grain from Finland. Thus considerable quantities of rye, barley, pot barley, rice and wheat are imported to these communes from Finland, partly via Lieksa and partly via Kuhmo. Some of this is transit goods from Petrograd. Grain ordered by the above mentioned zemstvos in the province of Povenets is delivered in the winter via Lieksa and Repola. The quantities of flour transported by this route were 81,200 kg. in 1902, 265,300 kg. in 1903, 29,400 kg. in 1904, 353,800 kg. in 1905, 206,300 kg. in 1906 and 147,400 kg. in 1908.

The fish trade has a long tradition in East Carelia even though it is no longer so great as it used to be. Fish still takes the second place in the export trade, both in quantity and in value; the first place is taken by forest and timber produce. Very large quantities of fish are caught in the government of Olonets, though much less than on the Murman and the White Sea Coasts, whence the fishmongers import supplies for sale in the southern centres of consumption.

Sea fish are mostly sold at the market town of *Suma* at the mouth of the Sumajoki on the coast of the Gulf of Onega. An old post road, as stated above, goes from here southwards to the town of Povenets. There is lively goods traffic along this road, especially in the autumn and winter. The most industrious carters and merchants are the inhabitants of Tulvoja, Suurlahti, Tenenitsa and Suoju communes in the province of Petrosavodsk. They make their expeditions to the White Sea coast in November and January. People from other regions also take part in these carting expeditions. It is calculated that an average of 1,820,000 kg. of sea fish, 575,000 kg. of it from the town of Suma, is annually transported in 5,000 loads, only to the town of Povenets and the market places in its neighbourhood. From thence the fish is distributed through middlemen to the various places of consumption, and goes even as far as Petrograd. This fish from the sea coast is even carted over still longer distances. It is reported that in the winter frozen, dried or salted sea fish is conveyed direct even as far as Petrograd. It is estimated (by Kryilov) that the total quantity of fish thus annually transported from the sea

coast to centres further south amounts to more than fifteen million kilogrammes, and that the number of horses used is about 7,000, the same horse making as many as five journeys there and back. Manufactured goods and groceries, grain, flax, hemp, rope, sail-cloth, etc. are conveyed on the return journey.

For further information concerning the fish trade, see the chapter on the fisheries, where particulars of the prices and quantities are given.

The trade in cray-fish from Olonets Carelia has recently begun to be organised. The northerly communes on Lake Onega are the main centres of this trade. Since the year 1905 cray-fish have regularly been sent to Petrograd from the commune of Suurlahti. Hundreds of merchants take part in this trade, and despatch an average of 68,000 baskets a year (each containing 100 cray-fish) to the capital.

The trade in forest game, like that in fish, has from ancient times been an important source of income for the government of Olonets, especially for the inhabitants of the province of Povenets. Particulars thereof have already been given in a previous chapter.

The timber industry and trade in wooden goods. It might have been thought that the extensive forests of the country, the cheapness of labour, the proximity to such a centre of consumption and such a place of export as Petrograd and the water communications with the Gulf of Finland and the Arctic Ocean would have produced an important wood industry. This is, however, not the case. This industry is still at a primitive stage, its methods are antiquated and its management has no wide views. Industry has concentrated mainly on the mineral deposits of the country and on mining, and the sawing industry has remained on a lower level. Since mining, and especially the iron industry fell into decay, as will be described later, the sawing industry, small though it still is, has taken a remarkable impetus, and come to hold the first place in the mechanical industry of the country.

There were in this territory six sawmills in the year 1908, apart from smaller sawmills for household requirements; four of these were in the province of Petrosavodsk and two in Povenets. The sawmills in the province of Petrosavodsk were as follows;

Messrs. Gromoff and company, at the village of Solomanni in the commune of Suoju. Number of hands, 72. Annual output 270,500 boards and planks. Working expenses 191,500 roubles, of which wages took 16,000 roubles.

Messrs. A. P. Belayeff and company, also in the commune of Suoju. Number of hands 117, wages 24,436 roubles. Value of the annual output 148,922 roubles.

Messrs. E. H. Brandt and company, at the village of Lisma in the commune of Kontupohja. Number of hands 100. Annual output 373,800 boards and planks. Working expenses 210,953 roubles of which 14,451 went in wages to the sawyers.

Messrs. S. Parishky, at Petrosavodsk. Number of hands 18. Value of the annual output, 4,750 roubles.

The following were the sawmills in the province of Povenets in the year 1908;

Kumsinski's, at the village of Lumpusa near the town of Povenets in the commune of Sunku. Number of sawyers 24. Annual output 126,048 boards and planks, worth 58,500 roubles. Wages of the sawyers only 4,559 roubles.

Uritski's (successors to the late P. Belayeff and company), in the commune of Sunku. Number of hands 61. Annual output 609,580 boards and planks, worth 138,500 roubles. Wages 12,770 roubles.

There is no doubt that there is a bright future before the sawing industry of Olonets Carelia. It only needs for its development more orderly conditions, the improvement of the means of transport, especially the timber floating channels, and more modern methods, which should especially keep in view the need of a variety of products for the foreign market.

There is also a future before the manufacture of chemical pulp. Up to the present (1908) there is only one chemical pulp factory in Olonets Carelia, in the province of Olonets. Its annual output amounted to 35,750 roubles, and it employed 43 hands.

Although the wood industry is so small, the *timber trade* has been and still is of great importance to the economic life of Olonets Carelia. As grain is first among the imports, so is timber first among the exports. The chief articles of sale are half worked goods, hewn in the forest itself, such as logs, props, pulp wood and fuel, while the products of the wood industry, such as sawn timber and chemical pulp still take a secondary place.

As mentioned in the chapter on forests and forestry, the timber from both Petrosavodsk and Olonets is almost exclusively sent to Petrograd. The province of Povenets, on the other hand, may be divided into three districts from the point of view of timber export. The smallest district, that in the northwest, transports and sells its timber to Finland; a somewhat larger district to the south sends its timber produce to Lake Onega, while the third and largest district, in the north, sends it to the White Sea coast, where part of it is sawn into planks for foreign export, in the sawmills of Sorokka and Kem, while part is shipped abroad direct as logs and spars.

The Russian Ministry of Finance states that it is unable to furnish com-

plete figures of the export of timber from the provinces in Olonets Carelia. It gives the following particulars, with a caution that the figures are lower than the facts. The exports for the year 1900 were as follows;

From the eastern part of the province of Povenets, which leads to Lake Onega (the town of Povenets, and the communes of Danilov, Petrovsko-Jam, and Rimskaja), 32,800 tons of timber produce (1).

From the communes of Mäntyselkä and Sunku in the province of Povenets, and the north-east of the province of Petrosavodsk (town of Petrosavodsk and the communes of Suurlahti, Kontupohja, Munjärvi, Tulvoja and Suoju), 63,900 tons, about one third each of sawn timber, logs, and fuel, worth together 100,000 roubles;

From the rest of Petrosavodsk (communes of Säämäjärvi, Pyhäjärvi, Ladva, Soutjärvi and Ostretchino), 130,000 tons of timber produce;

From the communes of Tulemajärvi, Vieljärvi, Videle, Kotkatjärvi, Riipuschkala and Njekkula in the province of Olonets and from the town of Olonets, 16,400 tons, almost entirely fuel.

From an area comprising the communes of Vaasheni and Mätysova in the province of Olonets, the town of Lodenoyepolie and eight communes in the province of Lodenoyepolie and three communes in the province of New Ladoga, 745,000 tons. Only about 122,000 tons of this is produced in the district, the rest being transit goods, mostly from the provinces of Kargopol Pudosh and Vytegra, from Ojatti and from round the sources of the Pashajoki.

It is not possible to state what quantity of timber goods is exported from the north and north-west of Povenets to the White Sea coast and to Finland. As there is no customs station on the frontier between Finland and the province of Povenets, Finnish statistics do not give any figures of the quantities of timber which are brought to Kotka from the Russian side down the Lieksajoki.

If timber is thus exported from Povenets to Finland it is also imported from Finland to Petrosavodsk and Olonets. This export from Finland includes some small quantities of planks, but chiefly consists of raw material bought by the Russian timber merchants on the Torasjoki, lake Suojärvi, and other timber-floating channels which lead from Finland to the Suojunjoki waterway. According to information furnished by the Finnish customs office, the following quantities of timber were exported from Finland via the Virtelä and Leppaniemi customs stations; 1912, 390 cubic metres, at a value of 14,820 marks, 1913, 53,706 cubic metres, value 912,902 marks, 1914, 65,338 cubic

(1) The original statement is in poods. 1 pood = 0.01688 metric tons.

metres, value 1,633,557 marks, and 1915, 36,627 cubic metres, value 455,464 marks.

The figures of the quantities of timber taken from the forests also help to give an idea of the timber trade of East Carelia. As stated in the chapter on forestry, the following quantities of timber were taken from the forests belonging to the state, private owners and the peasant communities respectively in the years 1904—08;

*Timber taken from the forests of Olonets, Petrosavodsk and Povenets
in the years 1904—1908.*

Year	Province of Olonets		Province of Petrosavodsk		Province of Povenets		Total	
	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber	Number of saw-logs	Cubic metres of smaller timber
1904	192,700	154,400	262,500	187,400	416,900	268,900	872,100	610,700
1905	146,400	461,200	175,200	209,700	335,300	39,000	656,900	709,900
1906	203,000	536,900	307,400	272,800	438,700	37,900	949,100	847,600
1907	279,000	558,300	348,800	328,200	564,800	11,600	1,192,600	898,100
1908	148,100	623,400	180,100	172,900	521,400	24,300	849,600	820,600

Obviously part of this timber was used for the needs of the population, and as raw material for the factories and home industries of the country, but the greater part was exported.

The wood trade of the government of Olonets gets a special character from the trade in *fuel*, and the transport of fuel by barges. The great city of Petrograd swallows up colossal quantities of wood for different purposes, especially fuel, and numerous fuel sellers, dealers, shippers and workmen get their living from this trade. According to the figures, the following quantities of fuel were imported into Petrograd in the years 1899—1901;

1899	.....	1,672,398	metric tons = about	1,968,000	cubic metres.
1900	.....	1,891,890	»	» = »	2,224,000
1901	.....	1,890,088	»	» = »	2,223,000

Out of the above the following quantities were conveyed by water on the Neva;

1899	.....	1,282,063	metric tons = about	1,510,000	cubic metres.
1900	.....	1,331,039	» » = »	1,570,000	» »
1901	.....	1,310,722	» » = »	1,542,000	» »

The rest was conveyed to Petrograd by railway.

Out of the wood imported by water, the following quantities came from the government of Olonets (i. e. not only the provinces of Povenets, Petrosavodsk and Olonets, but also those of Lodenyepolie, Vytegra, Pudosh and Kargopol);

1899	.....	507,780	metric tons = about	597,300	cubic metres
1900	.....	1,051,596 ⁽¹⁾	» » = »	1,237,000	» »
1901	.....	520,884	» » = »	625,000	» »

According to these figures, the government of Olonets would supply the Petrograd market with half the whole supply of fuel transported by water on the Neva.

The extent to which the supplies of timber imported into Petrograd go thence to foreign markets cannot be shown in figures. It is, however, probable that nearly a third of the wood exported abroad from Petrograd comes from the government of Olonets. According to the information available, the following quantities of timber were in 1907 noted as intended for export abroad.

Saw logs	.....	29,386	metric tons.
Poles	.....	149,615	» »
Beams	.....	142,440	» »
Aspen wood for the match			
trade	.....	33,972	» »
Planks and boards	.....	183,849	» »
Spars	.....	3,686	» »
Fuel	.....	14,513	» »

Total 557,461 metric tons.

(1) A very high figure, explained by the fact that during this year the peasants were granted the right of selling timber from the forest belonging to the communities, which led them to try and sell fuel in Petrograd.

Mining. As stated more fully in the chapter on useful ores and other minerals, there are various ores and minerals in the province of Olonets, and attempts were made long ago to use them in regular mining and industry.

Efforts have been mainly directed to the utilisation of the iron ore found in the region both in the form of rock deposits and as bog ore in numerous lakes and bogs. Although the supplies are large, especially of bog ore (more than 11,500,000 tons in Uikujärvi for example) its exploitation has gradually declined, as, owing to the poor means of communication, the working did not pay. This is shown by the following figures;

*Quarrying and Collection of Iron Ore in the Government of Olonets
in the Years 1897—1906.*

Year	Number of quarries	Number of lakes for collecting bog-ore	Metric tons of ore obtained	Number of workers
1897	13	17	24,286	506
1898	17	36	41 103	836
1899	11	33	28,370	736
1900	23	154	25,524	1,312
1901	12	21	20,763	296
1902	9	16	15,151	560
1903	—	12	9 040	219
1904	—	12	5,639	175
1905	—	10	3,793	100
1906	1	5	4,512	80

At first the ore was smelted in the state furnaces, of which the best known are at Kentjärvi in the commune of Munjärvi, Valasmo on the Sununjol i in the commune of Porajärvi and the St. Anne iron works at Suojärvi on the Finnish side. Later on a number of private smelting works were established, so that there were eight at work in the year 1899. After 1901 they began to restrict their working, chiefly because it did not pay. The mines are now under water, and the expensive buildings have been allowed to fall into decay. Owing to the lack of railways and other means of communication, the mining industry here cannot compete with that of the Urals and other regions. Some of the Olonets smelting works seem to have resumed work during the war,

The output of the smelting works in Olonets Carelia is shown from the following figures;

Smelting Furnaces in the Government of Olonets in the years 1898—1908.

Year	Number of smelting furnaces	Number of workers	Ore smelted	Iron obtained	Value of the product in roubles
			Metric tons		
1898	6	366	26,799	9,569	241,726
1899	8	376	49,413	11,214	273,409
1900	8	630	35,610	13,765	620,797
1901	5	?	22,584	9,661	292,680
1902	4	202	20,418	7,905	274,078
1903	4	139	11,956	4,181	91,279
1904	3	355	11,967	10,882	374,174
1905	3	304	23,060	10,847	548,271
1906	2	242	6,291	2,569	80,264
1907	2	222	?	?	114,378
1908	2	226	?	?	550,275

The presence of iron ore led also to the rise of an actual iron industry. A number of iron works and factories were established here, the first of them in the eighteenth century. There were several on the shores of Lake Onega. But owing to poor organisation and defective means of communication they gradually fell into decay. The works could not compete with those of other iron districts in Russia or with the Finnish iron industry. The only ones now at work are the state iron and ammunition factory at Petrosavodsk (the so-called Alexandrov factory) and one or two private establishments. The following figures, for the years 1898—1908 are available to show the output and number of employees of the iron works.

Year	Number of hands.	Value of output, in roubles.
1898	979	887,908
1899	988	769,312
1900	899	661,432
1901	?	572,024
1902	816	359,710
1903	928	325,022
1904	1,166	573,283
1905	1,410	723,928
1906	1,576	905,817
1907	1,181	850,629
1908	1,164	657,772

There have also been energetic efforts to make use of the copper deposits of Olonets Carelia, though with poor results. The only copper mines now at work are some small ones in the province of Povenets. In the year 1908 these employed 76 men, and the output amounted to 622.4 tons.

One cannot help regretting the decay of the mining industry in Olonets Carelia. The income therefrom might have formed an appreciable addition to the little budget of this country. In time a considerable body of skilled workers had grown up, especially as the trade descended from father to son. These workers have now been forced to seek a livelihood elsewhere, which has helped to increase emigration.

Shipbuilding. The large expanses of open water, such as Lakes Ladoga and Onega, joined to the important carrying trade in the waterways, has produced an established shipbuilding and repairing industry. It builds both sailing boats, the so-called «galjott» and «saima», and barges for goods transport. The biggest shipyards and repairing shops are at Petrosavodsk (three) Vosnesenia (two) and Vaasheni on the Svir.

We append a table showing the number of workplaces, number of employees and value of the output, between the years 1902 and 1908 in the provinces of Povenets, Petrosavodsk and Olonets.

Factory Industry in Olonets, Petrosavodsk and Povenets in the years 1902—1908.

Year	Number of work places				Number of workers				Value of the product, in roubles			
	Olon.	Petr.	Pov.	Total	Olon.	Petr.	Pov.	Total	Olon.	Petr.	Pov.	Total
1902	4	12	3	19	195	1,254	122	1,571	229,480	1,145,535	220,625	1,595,640
1903	9	15	3	27	141	1,406	114	1,661	63,341	1,063,421	249,414	1,376,176
1904	9	14	3	26	346	1,572	128	2,046	332,379	1,103,211	225,314	1,660,904
1905	5	13	3	21	305	1,769	143	2,217	520,045	1,126,558	216,776	1,863,379
1906	7	13	3	23	273	1,825	147	2,245	91,774	1,307,944	213,590	1,613,308
1907	11	14	3	28	218	1,532	142	1,892	101,605	1,281,612	235,878	1,619,095
1908	7	15	2	24	297	1,660	75	2,032	551,856	1,231,942	225,000	2,008,798

Home industry. By the side of agriculture, forest work, fishing and hunting, the Olonets Carelians carry on various kinds of home industry. Their skill is in places very great. Home industry is most active in the provinces of Olonets and Petrosavodsk, while industrious craftsmen are less common in Povenets. In Olonets smithy work and the manufacture of vehicles is on

a very high level. Other home products are wood-work, straw plaits and hats, fur articles, textiles, pastry — such as »water rings» — etc. In the province of Petrosavodsk there are skilful carpenters, joiners and turners. The occupations carried on include carpentry, tar-, charcoal- and lime-burning, net making, and certain kinds of smithy-work: Grindstones and hones are made from the sandstone of the district. Millstones are also made, and other stone goods. In Povenets the birch-bark work is the characteristic feature of the home industry. Other handicrafts of this province are basket making, cooperage, boat building, net making and smithy work. Guns are also made.

The following figures are available as to the number of work-places, number of workers, and the amount of their earnings in the provinces of Olonets, Petrosavodsk and Povenets.

*Home Industry in the Provinces of Olonets, Petrosavodsk and Povenets
in the years 1902—1908.*

Year	Number of work places				Number of workers				Value of the product, in roubles			
	Olon.	Petr.	Pov.	Total	Olon.	Petr.	Pov.	Total	Olon.	Petr.	Pov.	Total
1902	192	485	147	824	220	533	180	933	22,622	31,875	72,005	126,502
1903	200	395	142	737	234	489	153	876	24,416	26,452	4,369	55,237
1904	199	436	175	810	237	489	200	926	23,969	26,760	4,213	54,942
1905	201	651	163	1,015	251	723	187	1,161	29,342	31,984	6,354	67,680
1906	219	479	171	869	249	533	201	983	67,197	27,460	7,052	101,709
1907	188	453	175	816	207	614	218	1,039	22,312	26,757	6,833	55,902
1908	208	438	131	777	265	520	151	936	57,546	34,007	6,540	98,093

Commerce, markets and peddling. The general shop, where everything is sold that can find a purchaser, is typical of the business enterprise of Olonets. The same shop buys and sells wooden goods, grain, fish and game, leather goods, iron ware, groceries and haberdashery. There is, however, a certain amount of specialisation noticeable in the grain and flour trade, in the leather trade and with regard to intoxicants and medical requisites. The cooperative shops and societies also deserve mention. The best known is the Povenets Consumers' Association, and there are similar cooperative undertakings in Petrosavodsk, the Ostresheno »communal trading» and the cooperative shops in the villages of Ladva and Iivina in the province of Petrosavodsk.

The following table shows the number of shops in the towns and the country, and the amount of their sales in the year 1908.

Shops in the Year 1908.

Province	Number of registered businesses			Amount of turn-over		
	In the towns	In the country	Total	In the towns	In the country	Total
				Roubles		
Olonets . .	19	169	188	186,825	474,700	661,525
Petrosav. .	156	218	374	1,504,036	668,710	2,172,746
Povenets . .	11	96	107	219,100	413,300	632,400
Total	186	483	669	1,909,961	1,556,710	3,466,671

Markets, which formerly were so important, are now of little significance. The turnover at the chief market places has regularly decreased during recent decades. At the famous markets at Sunku in Povenets for example, the turnover in the middle of the nineteenth century amounted to a million and a half roubles, but at present is only 150,000—200,000 roubles.

Horse dealing is an important part of the markets, especially in the provinces of Povenets and Olonets. Horses are sold here not only from the neighbourhood, but also from Finland and from the governments of Archangel and Novgorod. Between 900 and 2,500 horses change hands each year at the markets, representing a value of 50,000—110,000 roubles.

In addition to the markets at Sunku, markets are also held at the Alexandro-Svirski monastery in the province of Olonets, at Vytegra and at the church village of Oshtinski on the southern shores of Lake Onega.

The total imports and exports of the forty-two markets of the government of Olonets in the years 1905—08 were as follows:

	1905	1906	1907	1908
Imports, in roubles	1,005,205	1,002,377	1,100,682	1,063,482
Exports, „ „	456,800	562,276	552,214	582,316

Peddling is not so important in Olonets Carelia as in the rest of East Carelia. It is mostly carried on by the inhabitants of the province of Povenets, and to some extent also by women in the province of Olonets. Their wares are different kinds of draperies, such as thread, linen goods and lace, and Olo-

nets straw plaits and hats. This peddling formerly extended far into Finland and the interior of Russia, but is gradually dying out.

The main *imports from Finland* into the provinces of Olonets and Petro-savodsk are wooden goods, horses, cattle and other animals, iron and iron ware, and vehicles. The corresponding exports are fish, grain and flour. As stated above, the wood imported chiefly consists of logs which are purchased by Russian dealers on the Finnish floating channels which run into Olonets. The grain exported to Finland, again, is mostly transit goods from the Svir district, and the fish comes partly from the White Sea, partly from the Carelian inland waters. The remaining goods imported into Finland consist of the products of home industry and meat and game bought from the markets by Finns.

We have already referred to the fact that there are no exact figures of the trade between Finland and the province of Povenets, as there are no frontier posts north of Suojärvi. The trade has been considered so insignificant that the frontier has not been watched. Yet, according to Russian sources, the Russian country shops at Lentiera, Repola, Omelia, Kolvasjärvi, Munjärvi etc. obtain all their goods from Lieksa on the Finnish side, and shop-keepers further north in Kiimasjärvi obtain them from Kuhmo, mostly during the winter. These imports comprise different kinds of flour and grain, salt, groceries, iron and ironware, vehicles and harness, anchors, rope, petroleum etc. Some of this is transit goods, ordered from Russia. To Finland the imports are fish (especially from the White Sea), fish-roe, game, furs, leather, meat, butter, berries, hay, straw, and so on. In the year 1900 the imports over the frontier from Finland to the communes of Repola, Rukajärvi and Paadene in the province of Povenets came to a total of about 950,000 kg., of which 200,000 kg. were transported via Kuhmo and the rest via Lieksa. These figures apparently do not include the consignments of grain which the zemstvo of Povenets orders each year for resale. (Cp. pp. 227—8). The goods exported to Finland came in 1900 to about 300,000 kg. The peasants in the frontier commune of Porajärvi, further south in the province of Povenets, carried on trade with the inhabitants of Ilomants. This commune also exports fish, game, meat etc. to Finland, and it chiefly imports the articles required for agriculture. The trade is, however, inconsiderable.

Province of Kem in The Government of Archangel.

The trade relations of Kem Carelia have a different character from those of Olonets Carelia. The waterways, the only lines of traffic in these wilds, generally do not run north and south, as in Olonets, but on the whole east and

west. This fact, and the situation of the country between the Finnish frontier and the White Sea, have caused trade to seek other channels than those it took in Olonets Carelia; it is directed westwards, towards Finland, rather than southwards towards Russia. Thus, even in the Middle Ages, trading expeditions were made from the mouth of the Kem river, right across the country to the Gulf of Bothnia, where furs and other White Sea products were sold. Later on began the transport to Finland of all sorts of industrial products, particularly textile goods, which came to the White Sea from the interior of Russia. Various necessities, spirituous liquors, etc. were bought in Finland and brought back on the return journey. This transit trade then gave rise to the peddling, which developed into a common source of livelihood for the country side.

The *peddling* begins in the autumn, when the land work is done. As recently as ten years ago, practically every man who had a taste for trade went off, and some of the villages were quite denuded of their male population. But they no longer obtained their wares from Russia to any extent, but bought most of them in Finland. The poorer pedlars borrowed their stock from the richer ones, who bargained for a share in the profits, or else made the borrowers their agents. The pedlars did not return home until May or June, and sometimes remained away for several years at a time.

According to I. K. INHA ⁽¹⁾ the villagers of Kiestinki and Pääjärvi mostly made their way to the Helsingfors and Åbo districts and Åland, those from Vuokkiniemi to central Finland, Tavastland and Ostrobothnia. Pedlars from Uhtua also visited these regions; as well as northern Finland, and those from Pistojärvi chiefly northern Finland. The inhabitants of Akonlahti, Luva-järvi and Kontokki traded in Savolaks and Ingria, and those of Paanajärvi, Suopussalmi, and Jyskyjärvi in Satakunta and the Åbo district.

The profits of this peddling were very small, as may be supposed, possibly a couple of hundred marks per man, and a few sacks of flour for the needs of the early summer. The peddling seems now to have decreased, owing to its unprofitableness. The number of Carelian traders who visited Finland in 1893 is supposed to have been 1,139, and their total profits 34,619 roubles.

The corn supply. The grain grown in Kem Carelia only suffices for four or five months. As in Olonets Carelia, therefore, the import of grain is one of the most important cares of the inhabitants. There are, however, but few corn-chandlers in Kem Carelia, the grain usually being purchased by authorities appointed for the purpose, such as the Archangel Food Committee, the direc-

(1) Kalevalan laulumailta, p. 419.

tors of the Archangel grain stores in the towns of Kem and Suma, and the communal committees for borrowing grain. The grain comes from the regions of Rybinsk, Kostroma, Jaroslav and Vologda, partly via Archangel and Onega, and partly as transit goods from the government of Olonets. Some Russian grain for Kem Carelia goes via Finland. No figures have been available of the size of the consignments of grain which go to Kem Carelia.

The *fish trade*, as shown in the chapter on the fisheries, is an important source of livelihood, especially for the coast population. Just as the men of the interior of Kem Carelia regularly go out peddling, so those of the coast go out to fish, mainly on the Murman Coast. Nearly all the summer work in the coast villages therefore falls to the women. КНИПОВИТЦА calculates that two thirds of the Murman fishermen come from the province of Kem. For the profits and sale of the fish, see the special chapter already cited.

The *trade in game* appears to have been from of old one of the most important sources of livelihood of Kem Carelia. It has now declined on the whole, though still carried on as a regular living in some places. According to the available statistics, the inhabitants of Kontokki, Jyskyjärvi, Paanajärvi and even of Njuhtcha, the most easterly commune, on the Gulf of Onega (see Fig. 55 for the village and river of Njuhtcha) are most active in killing game, while it forms but an inconsiderable source of income in Usmana, Kieretti, Kouta and Kandalaks. The hunters sell their quarry either at the Sunku markets, or at home to purchasers from Petrograd. For further particulars see the chapter on game and hunting.

The *wood industry and wood trade*. Sawing is the only occupation in Kem Carelia which has risen to the level of a real factory industry. As stated above, there are good prospects for its development into a great industry of importance to the economy of the whole countryside. There is no lack of raw material, and the extensive waterways lead to a number of harbour places on the White Sea which are suitable for foreign export trade. During the last few decades a number of sawmills working for export have been established on the coast. To the south, the best known are the *Sorokka* saw-mills at the trading centre at the mouth of the Uikujoki. Timber business is done here by Messrs P. Belayeff's Successors and Messrs Charles Stewart. Their annual export amounts to nearly 22,000 tons and a value of a million and a half roubles. The next centre of the wood trade towards the north is the town of Kem at the mouth of the Kem river; here there is a sawmill with seven frames owned by the Kem Steam Saw Mills Company Ltd. It employs 500 hands, and its annual export amounts to 10,000 standards of sawn timber. The village of Kieretti (Fig. 56), at the mouth of the Kierettijoki, must also be mentioned among the centres

of the wood industry. The sawmill of Messrs V. F. Savin in this village produces annually 5,000 standards of sawn timber, to a value of 250,000 roubles. But the centre of the whole wood industry of Kem Carelia is Kouta, on the bay of the same name. The following industrial establishments here deserve mention; the Swedish firm of Kovda Aktiebolag (Arendt Berggren), which has six frames, annual output of 9,000 standards, and 250 employees; Messrs N. Rusanoff and Sons (The White Sea Saw Mills Company Ltd.) with four frames, 7,000 standards annual output and 250 employees; and Messrs Charles Stewart, with four frames, 6,000 standards annual output and 350 employees. The line of sawmills stretches still further north, for in the village of Umba on the Kola Peninsula Messrs P. Belayeff's Successors have an establishment with four frames and an annual output of 8,000 standards. There are no wood pulp mills in Kem Carelia.

We mentioned in dealing with the wood trade of Olonets Carelia that it was chiefly concerned with half worked stuff, hewn in the forests, such as logs, props, wood for pulping, and fuel, while the products of the sawing industry take the second place. In Kem Carelia the reverse is the case. Here, sawn stuff is the main article of export. The figures of the export trade will be given below, in connection with the general statement of the imports and exports of the ports of Kem Carelia.

Mining, which has taken so important a place in the history of Olonets Carelia, is in Kem limited to some quite insignificant attempts. In the eighteenth century some veins of pegmatite were opened here and there, chiefly for the sake of the mica they contained. There have also been attempts at working fluorspar at Kandalaks. Gold and copper have been found in the Uikujoki region, and copper also elsewhere. Iron ore, especially bog-ore, is abundant in places, but has not led to any industry worth mentioning.

Home Industries, which in Olonets Carelia have old traditions and have produced good results, are so small in Kem as scarcely to deserve mention. This is easily explicable in view of the fact that the male population is away from home for a large part of the year, seeking a living by trade, timber hewing and floating, or fishing in the White Sea and on the Murman Coast. Moreover, the countryside is so poor that it cannot maintain special skilled workmen. Craftsmanship is therefore on a comparatively low level. The men can manage building work and carpentry, and make boats and sledges, but skill in joinery or turning is rare. This is partly due to the difficulty of obtaining wood for joinery, as nearly all the forests belong to the state. There is also an absence of skilled smiths, tailors and shoemakers. What is needed is therefore ordered and obtained from other parts, either from Finland or from Olonets Carelia.

The women's home industry is on rather a higher level than that of the men. It is true that materials and other woven products are bought from elsewhere, chiefly Olonets and Archangel, but both skill and taste are shown in the sewing, ornamentation and colours. In any case, home industries are quite unimportant from a monetary point of view.

The centres of trade on the coast, exports and imports. Regular sea traffic is maintained between the different ports on the coast of Kem Carelia, and to some extent also with foreign ports. The centre of traffic is the town of Kem (Fig. 57), from which vessels ply to Suma, Onega, the Solovets monastery, Archangel and the ports on the northern coast. This town is the centre of administration (post, customs, telegraph, hospital, government offices, police, prison, etc.) In 1904 the port was visited by twenty-three vessels (twenty-one steamers and two sailing ships) sailing under foreign flags. There was an equal number of Russian vessels. In the same year, 58 tons of fish were imported by sea, at a value of 4,270 roubles, while there were exported 17,752 tons of wood, at a value of 410,628 roubles, grain worth 36 and tar worth 12 roubles. Owing to the tides, vessels cannot put in to the shore, but have to load out in the roads. The port of Sorokka, the most important centre of trade and export in southern Kem Carelia, lies about eighty kilometres south of the town of Kem, at the mouth of the Uikujoki. In the year 1904 its exports were 22,723 tons of wood at a value of 525,769 roubles, 43 tons of grain at a value of 2,728 roubles, and considerable quantities of fish. The imports were 117 tons of fish, worth 8,035 roubles, 3 tons of salt at 33 roubles, 10 tons of coal at 100 roubles, 19 tons of machinery and iron and steel goods at 4,915 roubles, 40 tons of cement and bricks at 920 roubles, and other goods to a value of 1,600 roubles. During the same year, twenty-three vessels came to the port, and fifty sailed from it, twenty-one of them under foreign flags (a number of vessels had spent the winter there). Between Kem and Sorokka, and thirty kilometres north of the latter, there is the little harbour of Suiku, at the mouth of the Suijunjoki. The exports from here in the year 1904 were 46 tons of half-worked wood (spars and fuel) worth 339 roubles, and 46 tons of grain worth 2,640 roubles. The number of steamers sailing from the port was four. The market town of Suma, in the south of Kem Carelia, is a centre of the fish trade. It is situated at the mouth of the Sumajoki, forty-five kilometres south-east of Sorokka. There is lively transit traffic through this town, especially in the winter, with the transport of fish from the White Sea southwards to Povenets and Petrograd (cp. p. 229), and northwards of various necessities for the coast population. The numerous pilgrims to the monastery of Solovets also pass through Suma. In the summer there is less traffic. In

the year 1904 only four steamers called at the harbour, bringing fish and salt and loading with wood for the return journey.

The most notable harbours and places of trade in northern Kem Carelia are Kouta and Kieretti. Kouta, at the mouth of the Koutajoki, is the principle centre of traffic in this countryside, and is also an important administrative centre. In the year 1904 51 vessels entered the harbour, 49 of them under foreign flags, and 50 left it, 49 again being foreigners. In the same year the exports comprised 50,150 tons of wood stuff to a value of 1,340,478 roubles, 29 tons of other goods, to a value of 1,600 roubles, and considerable quantities of fish. The imports were small, and comprised 13 tons of fish worth 1,500 roubles, 1½ tons of salt, worth 50 roubles, 49 tons of coal and coke worth 500 roubles, 4 tons of iron and steel goods and 1 ton of other goods, worth 271 roubles. Kieretti has a good harbour at the mouth of the Kieretinjoki. Its exports were in 1904 4,786 standards of sawn timber at a value of 242,300 roubles and considerable quantities of fish. The harbour was visited by 12 steamers under foreign flags. Other harbours and places of traffic in northern Kem Carelia are Knjäsa or Knäsöi (a good harbour and fishing station) Mustajoki (fishing centre) and Gridinko.

The most important harbours and centres of traffic on the coast of Kandalaks are Kandalaks at the mouth of the Nivajoki, and Umba at the mouth of the Umbajoki. Kandalaks is known as a centre of fishing and trade, and Umba for its timber export. 10,710 standards of sawn timber to a value of 426,050 roubles, were exported from Umba in 1904.

The Murman Railway. A few words must be added in this connection about the new Murman railway. The proposal to build a railway through East Carelia to some port on the Arctic Ocean was first made in the eighteen-seventies but did not then lead to any result. Some twenty years later the proposal received fresh impetus, chiefly owing to the then Minister of Finance, S. WITTE, who made a journey to the Murman Coast in connection with the scheme. The town of Alexandrovsk, which was to be the terminus of the railway, was founded on the Kola Fjord in 1894, and in the following year the government began work on the Petrograd—Petrosavodsk section of the line. The work was shortly suspended, however, because the construction of the great Siberian railway and various other lines was thought to be more important. In 1903 it was resolved to resume work on the Murman line, but the Japanese War caused another postponement. The construction of the Petrograd—Petrosavodsk section was only begun in earnest in 1913, and the Petrosavodsk—Murman section not until the autumn of 1915.

The building of the Murman railway was then pushed on with feverish haste, for as the world war had closed Russia's access to the ocean through both the Baltic and the Black Seas, it was essential to maintain communication with the Allies through arctic ports. More than 25,000 workmen were employed on the works, including a large number of German and Austrian prisoners of war. They were mostly under the direction of American engineers, who had an extraordinary power of getting things done. The railway was absolutely finished in November 1916. It did not extend to Alexandrovsk, however, but a new terminus was established on the east shore of the Kola Fjord, some way north of the town of Kola, where a new town, called Romanov, was founded.

The average cost of the railway was 182,000 roubles per verst, or a total of 249,000,000 roubles.

The Murman railway is 1,459 kilometres long, reckoning from Petrograd, and comprises the following sections:

Petrograd—Svanka	.....	122 km.
Svanka—Petrosavodsk	....	284 »
Petrosavodsk—Sorokka	....	380 »
Sorokka—Kandalaks	.....	395 »
Kandalaks—Romanov	.....	278 »

The intention was to establish a good harbour at some point on the Arctic Coast which would be open to shipping all the year round (the port of Archangel is subject to serious ice difficulties, and is much too shallow), and to connect this with the Russian railway system. It was expected that this would prove a considerable economic benefit to extensive territories in northern Russia, especially if the Murman railway could further be connected with the Siberian railway. The connecting line, plans for which have apparently already been drafted, would start near Sorokka and run to the station of Plesetskaya on the Archangel-Vologda line, and thence on via Shenkursk, Kotlas (which was also connected with Archangel by a railway line in 1915), and Perm to Jekaterinenburg, where it would meet the Siberian railway. This would form a direct and quick route to a good place of export for Siberian butter and other agricultural produce, and the railway would at the same time facilitate the import of agricultural machinery and other articles of necessity to that land of great possibilities in Asia. Apart from this cross line and the economic advantages it may produce, the Murman railway is of the utmost local importance also. Special refer-

ence may be made to its importance and indeed indispensability for the Arctic coast and White Sea fish trade, and for the development of the wood industry in these regions. The vast wealth of fish in the Arctic Ocean and the White Sea is at present squandered by most primitive methods and absolute lack of system. The greater part of the catch is wasted for lack of communications and cold storage and conserving apparatus. The Murman railway affords fresh possibilities of development in this respect. The fish can be transported more speedily to the places of consumption, and apparatus for a regular large scale fish industry can quickly be sent up on the new line. The industry has certainly just as good prospects here as in Norway. It is the same with the wood industry. Sawing is at present the only wood industry at work in these extensive forest regions, and that is still in its beginning. The new railway will doubtless soon lead to a chemical pulp and a paper industry. It is possible that improved communications may also succeed in bringing the neglected mining industry to fresh life.

The Murman railway has extraordinary importance to Finland. A connection between it and the Finnish railway system would probably bring this country considerable economic benefit. But so long as the railway is Russian, it forms a danger which must not be underestimated.

ONNI LÖNNROTH.

6. The Posting System.

The posting stations on the great highways of Russia are subordinate to the Post Office, and provide travellers with conveyance at a cost of three kopeks per horse per verst. One of these posting roads runs through Olonets Carelia, from Petrograd through the town of Olonets to Petrosavodsk and thence on to Povenets and Suma on the coast of the White Sea (see fig. 32).

In regions which lie off the posting roads in Russian Carelia, as elsewhere in Russia, the officials of the state, the zemstvos and the communes have the right to conveyance. The majority of them obtain conveyance free, while others, including the priests, have it for three kopeks per horse per verst. Private individuals can also be given the right to conveyance for special purposes, by the zemstvo of a province or government, and this entitles them either to free conveyance or conveyance at the price of three kopeks per horse per verst (see figs. 58 and 59), as the case may be.

On the larger high roads there are posting stations controlled by the zemst-

vos of the provinces, which have a fixed number of horses (Fig. 60). If all these horses happen to be out, conveyance can also be obtained from the posting station belonging to the village community or mir. When the zemstvo has no posting station, the mir is alone responsible for providing conveyance. Most of the villages, especially those in remote parts, are completely without posting stations and the villagers share the posting work between them by the week. When a traveller arrives at such a village he has to apply to the dessiatnik (a local official), whose duty it is to know whose week it is.

In regions where there are no roads, travellers are conveyed from village to village on horse-back (see fig. 46), or else guides and porters are provided. Boat posting is in use for travelling by water, the price for one horse and driver being taken to equal that of a boat with two oarsmen and a steersman, two horses correspond to a boat with a crew of five, and so on.

The posting stations to some extent answer to the Finnish posting inns. Travellers are entitled to free quarters for the night. There are generally no conveniences, and the standard of cleanliness is poor. In the province of Povenets there are iron bedsteads with mattress and blanket, but no sheets.

The peasants have always felt the posting obligations as burdensome. The posting dues have not been raised during the war, although the number of travellers increased greatly as wounded and sick soldiers on leave had a right to conveyance. For this reason, and because of the fall in the value of money, the occupiers of posting stations applied to the zemstvos and village communities for permission to raise the dues, and struck in some places, when their demands could not be granted. The fact that strikes were not general, at least up to the autumn of 1917, although there is no doubt that the obligation was the source of great loss, is largely due to the fact that peasants who served the posting system were exempt from military service. All over the province of Povenets conveyance was still willingly supplied in the autumn of 1917, which is to some extent an evidence of the loyalty of the Carelians. Boat posting was naturally still more disadvantageous to the peasants during the war than posting by horse, and has often been quite unobtainable for lack of labour. Women have from ancient times been generally employed to row.

Although a conveyance is, therefore, not often refused at the posting stations, it often happens that the traveller is urged to enter in the day-book a larger number of horses than he actually uses. This is done so that if another traveller should arrive on the same day, the posting peasant may be able to say that the horses are not at home. Apparently this abuse is not considered



Fig. 55. Village of Njuhtcha on the Njuhtcha. Province of Kem.
Photo *J. Sourander.*



Fig. 56. Kieretti Church Village, at the Mouth of the
Kieretti River. Province of Kem.

Photo *I. K. Inka.*



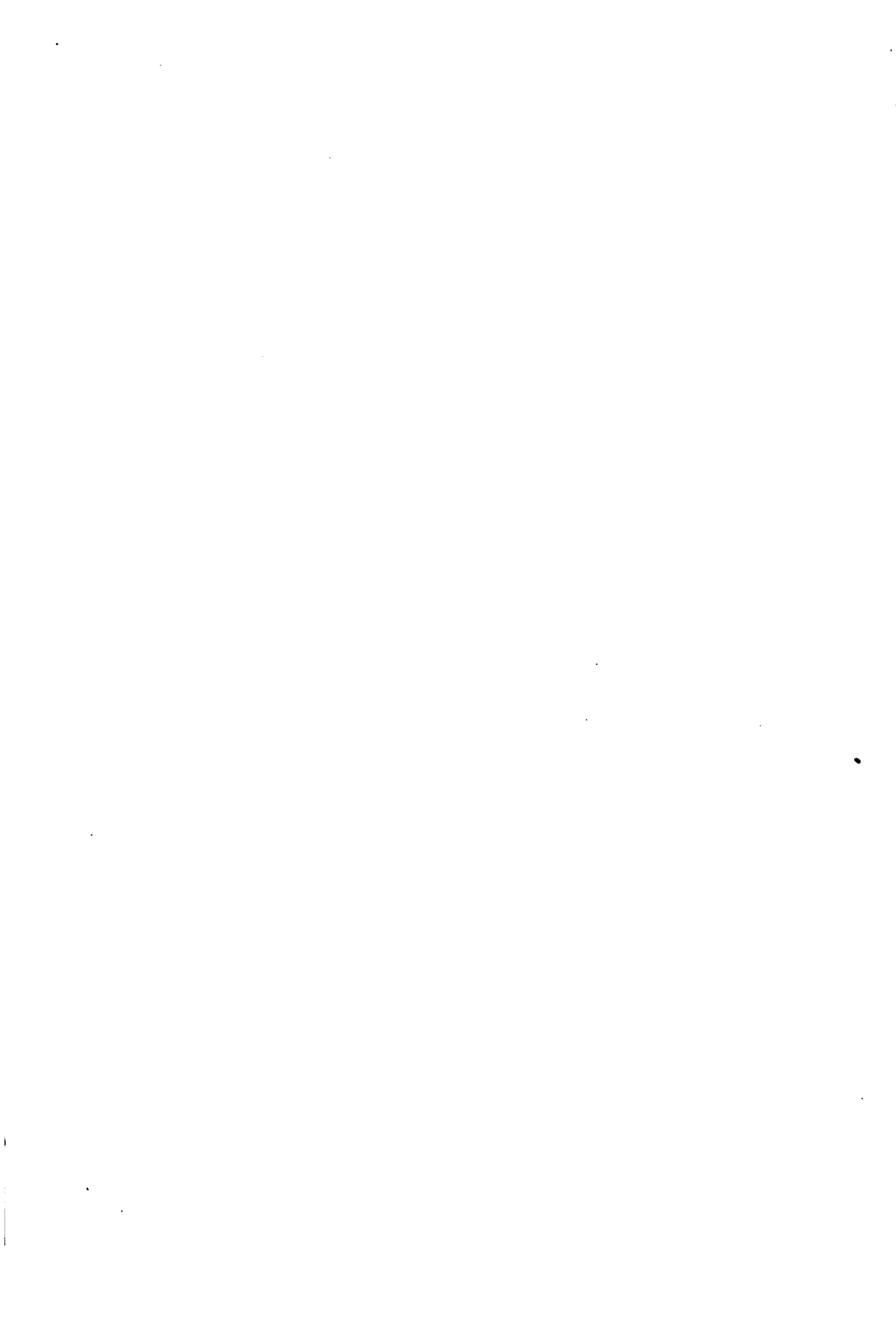




Fig. 57. Town of Kem.

Photo *I. K. Inka.*



Fig. 58. High Road in the Province of Povenets.

Photo *C. Munck.*







Fig. 59. Women Mending a High Road, Kentjärvi. Province of Povenets.

Photo *P. Eskola.*



Fig. 60. Zemstvo Posting Inn at Kossalmi. Province of Petrosavodsk.

Photo *P. Eskola.*







Fig. 61. Bringing Grain from Finland by Boat. The boat is being dragged over an isthmus. Kem Carelia.

Photo I. K. Inka.



in the least dishonest, for the same persons may be very scrupulous when it is a question of observing a fast day.

P. ESKOLA

7. Intercourse by Water.

The Carelians, like other Finnish races, were formerly a boat-building people. OLAUS MAGNUS gives the following account, which shows that the abundance of lakes in their country early educated them as inland seamen, if such an expression may be used. »They use for ship building the pines and firs of their forests, which they split into narrow planks and join together with great skill, using nothing but the fresh tender roots of the trees, which serve as hemp rope. Others, again, tie their boats together with twisted withies of aspen or other wood. Others again build their boats by tying the planks together with the sinews of animals twisted together, polished and dried in the sun and air. All the boats, however they are built, are carefully smeared with tar from the pine trees.» The picture which accompanies the above description of boat building in Olaus Magnus' History of the Northern Peoples, is also shown on his map of the north, but here he has placed it on the shores of Ule Lake, so it is possible that he had in mind the boat building of the people of Kajana. There is another picture of a boat on Olaus Magnus' map, between Ule Lake and the White Sea. Here four long-bearded men are shown dragging a boat across from one waterway to the other. Nevertheless he says in his History, which contains the same picture, that »as soon as the road is closed by lakes and rivers, they build new vessels, on which they carry their goods over».

The Kalevala lays, which have been preserved to our own day in some of the most remote villages of East Carelia, also bear witness to the seamanship of the Carelians. It is also shown unmistakably by the history of the settling of this frontier land. By the help of the traditions still preserved here and there, one can in many cases trace the swifter advance of the population from lake to lake along the water systems, and its slower march across the watersheds, especially when these are formed by mountain chains which closed the way or bogs which obstructed it. The population settled in comparatively large villages on the more important waterways, or at places where paths and roads crossed navigable waters. The waters near the villages were usually soon despoiled of their fish, and the population was obliged either to seek new fishing grounds in the lakes of the wilds, or to abandon fishing as their chief

occupation and take to trade or other means of livelihood. In the former case they maintained their former skill in moving on the water and in building boats, while in the latter case the boat building craft was forgotten, or carried on as a trade usually by some few families, and occasionally by a whole village. At the present day, for example, the village of Laasari in the province of Povenets is famous for its good boat builders.

It is still considered a necessity to have a boat in nearly every homestead. It is wanted if one is going to make a fishing expedition to some lake in the forest, on the shore of which a so-called fisher's bathhouse has been built. These small, low huts are called bathhouses because they are heated by stone stoves without chimneys and placed in a corner as far as possible from the door. The walls are generally of cloven logs, the roof is covered with birch-bark, and the chance visitor makes himself a floor by carrying in an armful of fir branches, which he straws on the part where he means to rest. When the stove is heated, the hut is filled with smoke, one good result of which is that the mosquitoes make their way out, sadly humming, through the cracks in the walls and roof, but has on the other hand the disadvantage that one cannot keep one's eyes open. The length of time spent at a fisher's bathhouse may be longer or shorter — in other words, it is as long as the fish last. Boats are also needed for going to make the hay in the excellent sedge meadows on the banks of rivers or lakes, which are often at a very great distance. There, what are called hay bathhouses have been put up, so that a roof may be available for the nights and in case of rainy weather. To the inhabitants of the wilds, who have no practicable roads leading to their villages and homesteads, boats are naturally indispensable, and the waterways are just as important to intercourse as in the olden days.

As far as we can judge, the art of shooting rapids was highly developed among the ancient Carelians, but now it has been forgotten in many places, especially where there are good roads. But in the north of East Carelia, for example, men can still be found who are skilled in steering through the rapids, and good boats for such waters. Boats of the same model as that used in northern Ostrobothnia are still in use on Kuittijärvi, while on Tuoppajärvi, for example, short high boats with high prows are used, which live better in the choppy waters of that stormy little inland sea. The boats on the river Kem are shorter than those of northern Finland, but nevertheless excellent for the rapids. On the Uikujoki, on the other hand, the boats are comparatively clumsily built. Those on the Lieksa water system are something like the Savolaks boats, and those on Onega are more or less of the Ladoga type, though not so heavily built.

Shooting the rapids in East Carelia is generally a very difficult sport, for no trouble is taken to clear the channels so as to make boating easier. For this reason, boats are in many places kept above and below the rapids, or else they are dragged over land beside the rapids on causeways or rollers (fig. 61). Boats are seldom punted up or down the rapids, as is the custom in many parts of Finland, and an oar for steering with is only used in going down the rapids in the northern watercourses and near the Finnish frontier. On lakes and broad stretches, it is usual to row with two pair of oars, the man sitting in the stern rowing forwards and steering at the same time. On the Tchirkka-kemijoki one can still sometimes hear the man in the stern hum bars from the Kalevala to mark the time for the oars.

In the parts where the waterways are still the only or at least the most convenient means of communication, boats are obtainable at the posting stations at a fixed tariff (cp. the chapter on the posting system.) Nowadays, owing to the lack of labour, boat-posting is supplied most unwillingly, especially during the hay harvest. In the interior of East Carelia, however, where there is no other means by which the traveller can proceed, the peasant heaves a sigh and makes the best of his fate to send the voyager on, in order that he may not tarry longer in the homestead.

If a road or path ends at the shore of a lake, and the village to which one is proceeding is on the opposite shore, one shouts for a boat from the village with all the power of one's lungs, and if the sound is not heard, lights a fire as signal. The peasant who is liable for the posting is obliged to heed the signal and fetch the traveller across. It used to be the custom of the Russian officials to have two signal fires lit, to show that the travellers were »masters» and demanded the best boat and greatest possible speed.

The water systems and rivers which are most used for traffic are the Koutajoki, Tuoppajoki (difficult rapids) and the Oulankajoki (Kivakkakoski rapids), the Kieretti system, the river Kem (little used for boating below Usmana as there is a good high road on the left bank), the Kuittijärvi system, the Tchirkka-kemijoki and the Kivijärvi system. Much frequented waterways lead from the two last systems to the parishes of Suomussalmi and Kuhmoniemi on the Finnish side of the frontier. The Lieksanjoki is also frequently used for expeditions into Finland, in spite of its numerous small rapids and currents, until Pankakoski rapids, near Pielisjärvi, prevent further progress. According to the information in historical documents, there was during the Middle Ages fairly lively traffic via Pankajärvi, Tuulijärvi and Kolvasjärvi to Repola and thence through Roukkala, Kiimasjärvi, Leasjärvi and Piismalahti and finally along the river Kem, to the town of Kem. Boats seem to have been used in

the summer wherever possible for transporting goods all along this line.

Before the Murman railway was built the river Uikujoki was much used as a boating way.

The waterways of East Carelia offer excellent opportunities for communication by motor boat. The small rivers and lakes of the south are particularly suitable for this purpose. Motor boats have long been in use on the wide, open stretches of Ladoga, Onega and Seesjärvi, although, owing to the high seas, they have mostly to be limited to coast traffic. Tugs, used to tow the timber rafts, are seen on the northern lakes, Pääjärvi for example. But on the swift rivers of the north the only boating possible is that with strongly built river boats. Nevertheless, many of the rivers which contain many rapids also have long stretches of open water which are suitable for motor boat traffic. Such rivers are, for example, the Uikujoki, Sekehenjoki (Segesha) Sununjoki, and Suojoki. There is lively steamer and goods traffic along the Svir, which forms one link in the canal route which connects the Gulf of Finland with the Volga, south of the level southern shores of Ladoga and Onega.

The great variations in the height of the water is a hindrance to traffic on many rivers, as also in northern Finland. The spring comes quickly in the interior of the country, and makes the snow melt fast. This easily causes floods, especially as no one thinks of cleansing the water courses. In the late summer, again, there may be a long drought, which causes the water to sink considerably, to the detriment of boating. These variations in the water level are still more noticeable in places where the forests have been cut down, as round the villages and the railway. On the other hand, where there are large bogs or marshes within the basin of the water system, these serve to minimise the variations, and the central lakes also form reservoirs which receive the superfluous water and afterwards distribute it to the rivers draining the lakes. Tree trunks, branches and all sorts of floating brushwood collect during the flood season in the rivers of the wilds and especially in the winding bog-streams, and may close the whole channel and thus prevent boat traffic.

The waterways of East Carelia freeze early, and this diminishes their value as channels of intercourse or timber floating. But on the other hand, during the winter they form excellent sledge roads. The Carelian is, we know, a keen trader, and makes a pleasure of trading expeditions. Winter journeys are especially popular. The men lie indolently on the loads and chat with their companions while their sledges glide slowly forward on the level ice.

J. E. ROSBERG.

FINAL SURVEY OF ECONOMIC, RELIGIOUS AND POLITICAL LIFE.

As the above account shows, East Carelian agriculture can be substantially improved, and has a splendid future before it. The forests and water power, however, form the chief wealth, and these natural resources are certain to give rise to very important industries in the future. We say »in the future«, for the utilisation of this forest capital, for various reasons, cannot and must not be forced on too hard.

For the sake of the population and its weal, those responsible must try very seriously to prevent this land from becoming merely a Tom Tiddler's ground for speculators and great capitalists, for whom forests and water power have a peculiar attraction. These resources must of course be rationally utilised, that is clear, — and we shall have something to say about this later on — but the economic and social progress of the population must not be ignored, and it is in this direction that reform is most pressing. We have seen how agriculture can thrive if the peasants own their land, communications are improved, and the standard of education in the country rises. This last necessity, which is just as indispensable as the others, and is indispensable for progress in whatever sphere, leads us to the social and political sides of the question.

In previous ages, the Russian government took very little interest in the Carelian country. At the end of last century, at the time of the high political schemes for expansion in the north-west and the russification policy in Finland, there began violent efforts to denationalise East Carelia also. But such a policy does not lead to progress and the advancement of culture. On the contrary, it is destructive, and a bar to progress. And everything suggests that if conditions in Russia should become orderly, which must happen sooner or later, there would always be the danger of denationalisation, if East Carelia remained under Russian domination. Even if the government should be particularly good, and tender for the interests of the population, one cannot expect that it would wish to further the national aspirations of the Carelian population.

These aspirations are bound to appear to the Russian mind more or less in the light of separatism, especially as Finland lies just beside. And in any case, even if the government were as liberal as possible in the above respects, conditions under Russian rule — the Russian officials, schools, the direct railway communication with Petrograd and the interior of Russia while certainly no such communication would be established with Finland — could not fail to have a denationalising effect. If, therefore, social progress in East Carelia is to proceed on a national basis — the only sound and natural basis on which it can prove fruitful —, this can only take place through the union of that country with Finland. The Carelians realise this perfectly well, and long for such a union. Geographically, physically and ethnographically, this country forms with Finland one natural and continuous whole, while it is clearly and sharply divided from Russia. If the Carelians were to form *one* people together with us, they could receive in their own Finnish language the culture we Finns have received from the west, and the methods of agriculture which are suited to the very similar natural conditions of the two lands.

What has been and what ought to be the attitude of Finland towards the East Carelians' desire to be united with our country? Different views on this question are taken in Finland.

It is right to examine the question carefully. The safety of this country must not lightly be exposed to menacing dangers from future complications and ideas of reconquest, which might possibly be the result of the transference of a large territory from Russia to Finland. Nevertheless, it may be said in answer to those who warn us against a union of East Carelia with this country, or at least against any demand for it or intervention in the matter on our part, that we are naturally all trying hard to establish good relations and neighbourly friendliness with the future Russia. This is of course essential. But this good relationship may be jeopardized in the future, if East Carelia and the Kola Peninsula continue to be Russian possessions. Even supposing that we, suffering from the strain of economic and other difficulties, now resign ourselves, it is highly improbable that the coming, growing generation, on both sides of the frontier, can endure with calmness a permanent «irridanta»; they will resent the knowledge that now, when something really could have been done, nothing has been gained but a promise by the Bolsheviks to grant the East Carelians autonomy, — a promise which has proved absolutely valueless. And what will our relations with Russia be like? It must surely be admitted that we could not possibly see our kinsmen, who by nature belong to Finland, going slowly but surely towards a national death and exploited by foreign usurpers, and at the same time maintain cordial relations with

Russia. Such a degree of self-abnegation is unthinkable, and when whole peoples and future generations are concerned, would be false and despicable. If, on the other hand, East Carelia were united with Finland, it ought soon to be possible for relations with Russia to become good and friendly again. For *East Carelia is a Finnish country*. Russia knows that, and that is the basic fact which settles the question. It may at the moment be wounding to chauvinist natures in Russia to surrender this territory, but it is no question of piercing the national heart or sundering the national unity. It seems to us, therefore, that the great historical, social and general human considerations must decide the verdict in the end. And, as often before in history, they will in the end prove to be those which can best safeguard peace between the peoples.

From this point of view, it is *our* duty, more than any one else's, to try to save the Finns east of our frontier from the national death which threatens them as long as they remain under the dominion of Russia. The Finnish race ought at last to be united into one whole, a single people. The recently gained independence of Finland will be only half accomplished if only part of the whole is set free, only part of the people which has for centuries inhabited and cultivated the great territory lying between the Gulf of Finland and the Gulf of Bothnia on the south and west, the Arctic Ocean and the White Sea on the north-east, Lakes Onega and Ladoga on the south-east, while the part which inhabits the eastern portion of this, our natural territory, is left to meet its death. Russia cannot raise the culture of that land, to which it is a stranger. This task is ours. It is on us that the enlightened members of the population build their hopes. To us they have addressed their appeal for help. It is our duty to try to extend to our brothers the western civilisation that we have received. If we do so, we shall be doing *a good deed in the service of human civilisation*, and we ourselves shall gain in strength and in esteem. If we fail, on the other hand, the vengeance may fall terribly upon ourselves.

It must certainly be admitted that Russia's interest in reconquering Finland might be increased by a union of East Carelia with Finland, and especially by the loss of the Kola railway, which connects Russia with an ice-free port on the world-ocean. That disadvantage could, however, be very considerably mitigated, for Finland would naturally, if only in its own interest, be anxious to make Russian traffic on that railway as easy, speedy and cheap as possible. The internationalisation of the railway could also be considered. And if we have to fear a future attack from Russia, which may be the case quite apart from the question of East Carelia and the Murman railway, the union of East Carelia with Finland would make us much stronger in defence. The frontier against Russia between Lakes Ladoga and Onega, and between

Onega and the White Sea, would be only a quarter as long as that from Ladoga to the Patsjoki, and for this reason in itself many times easier to defend than the present strategically «impossible» frontier. The defence of this, when the enemy had the Kola railway in his rear, would be exceedingly difficult, and would at once demand very huge armies.

We sympathise with our brothers east of the present Finnish frontier, who in their simple conditions and thanks to their hitherto isolated position, cut off from the outer world, have faithfully preserved their nationality pure and fresh. This sympathy exhorts us to do what lies in our power to bring about the union of East Carelia with the rest of Finland. We ought also to do all we can for the betterment of that backward country, to develop it, and to help it to coalesce with the rest of Finland into a strong and united whole. The example of the re-union of the province of Viborg with Finland 1812 gives good hopes that we could attain that end.

But just for this very reason, we must not, if the union takes place, regard the new territory chiefly as a field for exploitation by industries and greedy capital. We must think above all of the general spiritual and social welfare of the people in that part of the country. That is our duty, and that will enable our efforts to unite that country with the rest of Finland.

The account of the land and people of Kola Lapmark and East Carelia contained in the present book, is in what follows made the basis of certain conclusions, and certain reflections as to the lines which should be followed, in planning measures for the benefit of this land. The possibility of a union with Finland has been specially taken into consideration in discussing church matters, although many of our compatriots have shown some anxiety at the thought of the dualism in religious faith which would result in this country from the incorporation of East Carelia.

Occupations.

Agriculture must naturally receive the greatest attention among the occupations of the country. This has been the case in most countries, and in the future may perhaps be so to an even greater degree than before.

In Finland the government has always wished to give special support to agriculture, but nevertheless agricultural progress has been less than was hoped,

at any rate in comparison with the bounteousness of the authorities. And while agriculture, in spite of all the nursing it got from the government, made only moderate progress, forest industry — I will not yet say proper forest-care — has had a notable boom, owing to individual enterprise and skill, and the natural advantages possessed by this country.

Thus the experience of Finland does not go to show that the state, by favouring one particular occupation, always produces the effect intended. Yet one is bound to maintain that the state ought to do what it can, and even make certain sacrifices, in order to improve East Carelian agriculture. This territory must be regarded as almost unbroken, virgin soil, which has to be populated and cultivated, a land where there has not yet been any real cultivation. Under these conditions, it is right and natural for the government to do a good deal in the way of assistance and regulation, much as when a new territory is being settled.

The soil is very fertile in the south, round Lakes Ladoga and Onega, and all over East Carelia the climate is such that agriculture could be remunerative. A sufficient number of small and modest agricultural schools should be established in connection with model farms, and competent instructors appointed. The most important thing, but unfortunately also the most difficult, is to obtain as heads for these establishments and as instructors really skilled and practical men, who can see and understand what the situation and conditions of this new land demand.

The peculiar conditions of land-ownership in this territory call for special measures of reform. Most of the land is owned by the state. In the three southern provinces, Olonets, Petrosavodsk and Povenets, the state owned before the war 68% of the soil, and the peasant communities 29.9%, while in the vast province of Kem, the state owned 98.5% and the peasant communities scarcely 0.7% of the whole. The rest belonged to the towns and religious houses. The old institution of the *mir*, with the soil as the common property of the village communities, was still in practical force. In the three southern provinces each homestead had on an average 80.2 hectares of the land belonging to the village communities, and this is not little, but in the province of Kem the average was only 7 hectares. In all the provinces, however, the amount of cultivated land is very small, being generally one or two hectares per homestead.

If the conditions of landownership are to be improved, a general division of the land must be carried out. At the same time it must be arranged that each peasant household which tills the soil receives a sufficient amount of cultivable land. Where the area belonging to the village community is so

small as not to provide enough land for each homestead, it must be supplemented by the state on favourable conditions. This is the case nearly everywhere in the province of Kem, and in some places in the southern provinces. As burn-beating has already been stopped in the state forests, those of the inhabitants who really need more land, to be able to make their way, must naturally receive it. There will in any case be vast areas left for further settlement, even if the state wishes itself to retain the greater part of its present large territory.

It is equally important, as we tried to make clear in the section specially devoted to the description of agriculture, that the area of the large and thickly populated villages should be so divided and distributed that each homestead can receive its holding as near as possible to the dwelling-house. This will certainly involve great changes and take time, but if good results are to be attained no other course is possible. The important thing is not in the least that each homestead should get a lot of land, wherever situated — possibly some tens of kilometres distant, as meadows often are now — and forest to sell for a song, but that really good and profitable agriculture should be established. The natural conditions exist, but without this reform the end cannot be reached. And, naturally, the best and only right course is for this reform to be made at the same time as the land is given to the peasants — otherwise the latter measure will be a complete failure, and the difficulties of the former considerably greater. The state must also do all it can to assist further settlement and cultivation of the vast tracts in the future. It is above all imperative to get this great country peopled with capable people who will found families and have good incomes, so that they can support and look after their families. This is the only way in which anything good can come of the country of Carelia.

It must be added that the bogs and bog-meadows of several regions, especially of the southernmost part of East Carelia, are of excellent quality and easily cultivable. It is possible that in the more fertile southern parts of the country bog-cultivating settlements might be considered, such as have been much under discussion in our own country for the last fifteen or twenty years.

Even though East Carelian agriculture is at present at a very low level, there are in most regions good and in some places exceptionally good prospects of profitable tillage, if only adequate communications are established, the land is better divided, and knowledge of methods of cultivation becomes more general. The large cultivable territory offers plenty of space for settlers, and if a few skilled agriculturalists from Finland or other agricultural coun-

tries were to settle down there, they are bound to help to spread a knowledge of their craft among the natives.

Fishing. The descriptive sections show that fishing is the chief occupation of the population of the Kola Peninsula and the greater part of the province of Kem. In the south of East Carelia also it plays a very important part in the economy of the population. During the last two decades, the Russian government has done a good deal to assist the fisheries on the Murman Coast. Various measures are, however, still needed. The sea fishing carried on by the inhabitants has hitherto been wholly confined to coastal fishing within the territorial waters. But if the freightage along the coast were somewhat improved, companies and associations from the Murman Coast could trawl in the open sea outside the territorial waters, to much greater advantage than foreigners who have to come from great distances.

Appropriate inspection and instruction, dealing for instance with the conservation and sale of the fish taken, could greatly improve both the sea fisheries of Murman and the White Sea, and the lake and river fishing of the whole territory, including Onega and Ladoga in the south.

It would also be desirable and necessary to establish a few simple and practical fishery stations in connection with the work of instruction, and as points of support for it. The greatest attention should be paid to the salmon fishing in the salmon rivers.

Forestry and Industry. The greater portion of the country almost up to the Arctic Coast consists of forest land, part of which is very good and part rather lean, together with bogs and marshes, the bogs often carrying fairly good forest. As most of this land belongs to the state, and north of the sixty-fourth latitude practically all the land, a very extensive organisation is required to give these forests even tolerable care. The paucity of population, the poor means of communication, the fact that in the upper reaches of the rivers little has yet been done to improve the channels for timber-floating, together with the lack of purchasers, especially for the smaller timber, all combine to prevent scientific forestry and the economic utilisation of the timber resources. The state income from this vast territory has been very small, considering the mass of timber there, as has been seen in the section on the forests. It is scarcely possible to count on a larger revenue, either, until the above deficiencies have been remedied.

In these northern regions, moreover, there is need of great care in cutting and exploiting the forest. The outermost forest zone of the Kola Peninsula is in the most literal meaning of the term, a cover against the arctic winds and the polar influences. But even in East Carelia proper, from Kandalaks south-

wards, the utmost care must be taken to avoid any kind of devastation of the forests, both in order to prevent bogging of the forest land, which easily occurs in these northern regions, and in view of the extraordinary importance of the East Carelian forests from a climatic point of view. This importance stretches far beyond the frontiers of the country, over all Finland in particular, and is in this country very great. The forests of Kola Lapmark and East Carelia protect us against the drought and frost in the early summer which the cold northerly and easterly winds would otherwise bring from the White Sea. We have quite enough already with the dry north-west winds from the Gulf of Bothnia. If the East Carelian forests should be destroyed, the winds from the Arctic Ocean and the White Sea would beyond all doubt be still more devastating than these others. The forests of the south of East Carelia have likewise a great climatic importance, which also extends to Finland, in that they add to the moisture of the atmosphere in the dry early summer, when easterly and south-easterly winds prevail. Thus they increase the rainfall of Finland, which, as shown in the section on climate, is at that season altogether too small. Thus the forests of East Carelia must be exploited with the utmost caution and scientific thought, and in general, forestry must be given the most careful attention.

Means of Communication. Several of the descriptive chapters have already spoken of the urgent need for better communications, and it is easy to understand that intercourse is not sufficiently served by boat traffic in the summer on the lakes and rivers, encumbered as the latter are by rapids; and horse traffic over the snow in the winter. The very defective road system must be developed and ramified. Railways and steamboats must gradually be introduced. All this is essential if industry and civilisation are to be made to flourish in the country.

If East Carelia should be united to Finland, the East Carelian railway, the so-called Murman railway, must naturally be connected with the Finnish railway system. The first step would unquestionably be a railway eastwards from Sordavala to the neighbourhood of Petrosavodsk, and afterwards other lines further north. These would include one from a suitable spot in Finland to Kem, and still more important, one from Rovaniemi, via Kemijärvi and Kuolajärvi in Finland to Kandalaks. This would give us a good railway connection with the Murman Coast. The highroad communication between Finland and East Carelia must naturally also be extended and improved.

Religion and Education.

Religion. In passing from economic to spiritual conditions, we are first of all faced with the fact that practically all the inhabitants of East Carelia belong to the Greek Catholic faith, and adhere firmly to their hereditary form of worship.

If this land should be united with Finland, that condition must be scrupulously respected. It has certainly hitherto been taken for a potent truth that unity in religion is a strength to a people. This will naturally also have a significance in the future, but difference of religion need no longer estrange people from each other, if they otherwise agree and respect each other. This is evidenced in the greatest civilised countries of Europe. The forms and dogmas do not mean so much in the end. We all recognise the same God, and the same Christian teaching, Love thy neighbour. The only difficulty is to follow this high teaching. It speaks well for the simple people of East Carelia that they adhere firmly to their faith, especially when we think of the fairly general indifference to religious things which unfortunately prevails in this country. It seems, therefore, somewhat presumptuous that many hope that if East Carelia were to be united to Finland, the inhabitants of that country might be induced to come over to the form of faith which we confess. Our own religious feelings and faith must be much stronger and more lively before we can think that we have a right to try to make proselytes for our form of worship, and to be given strength for successful work to this end.

Perhaps, on the other hand, paradoxical though it may sound, this difference of faith might lead to greater religious life on both sides and stimulate a spiritual awakening. It may be that the substance of Christ's lofty teaching, which is common to all, will be more strongly and clearly emphasised than hitherto, the forms and cults and dogmas less. As these lost their significance and power to inflame one man against another, the adherents of the different faiths might draw nearer together, and finally understand the real meaning of Christ's teaching, which commands »Thou shalt love thy brother». This must be the course of progress, and thus must unity be attained, by ennoblement, development from within, so that the best in each is preserved and strengthened, not by exhorting individuals to put on another, different cloak of dogma, with other, more western embroidery, in the false belief that this will make them better. After all that we in this country have experienced, we cannot boast of our Lutheran faith, or rely on the strength of our religious life. The truth is, as I have said, that religious life is not very strong here, and

many retain only certain traditional forms of their confession, and others nothing at all. It is therefore almost a mockery of Luther himself, to suppose that an external conversion to his teaching would benefit either the re-baptised or, if East Carelia should be united to this country, the religious conditions of the new, greater Finland. Probably hardly anyone could maintain the former thesis, and the latter is also only an empty illusion, for form without the substance is no better, however great the form may grow.

The East Carelian church has subordinated under the Holy Synod in Petrograd, but many Carelians have desired long and earnestly to be free from this supremacy and to choose their own primates. The revolution in Russia has now brought the opportunity for this severance, and if the Greek Church in Finland is made autocephalous, and the relations between our Lutheran Church and the state are also loosened, the difference of religion will put no great difficulties in the way of intimate union and cooperation in mutual confidence, between the Finnish compatriots of the east and the west of the new, enlarged Finland. The only condition necessary is that the Greek Catholics in East Carelia should be firmly convinced that the state will under no circumstances tempt or inveigle them, and still less force them, to leave their old faith and adopt the evangelist Lutheran belief, while the evangelist Lutheran subjects of Finland should show no aversion to the others, nor — as has unfortunately been not unusual in religious disputes, — any superiority or scorn for them. If the others, again, should show feelings of repulsion for the Lutherans, the latter must bear it calmly, remembering that in matters of feeling it is for the majority to show calm and balance, and that the majority is mainly responsible for the preservation of peace between those who differ in opinion. The majority has no need to fear any consequences if the minority should happen to give expression to illwill. The minority on the other hand always has to reckon with the possibility of a threat pronounced by the majority being carried into effect, and has therefore more excuse for suspicion and bitterness, and the more so, the more firmly it holds to a right which is menaced. Moreover, if we on the western side of the frontier consider ourselves to be further advanced in civilisation, we ought to remember that it is the duty of higher civilisation to show greater tolerance.

By the union of East Carelia with Finland, the inhabitants of the former country would gain the great advantage that they could have their religious instruction and their spiritual exercises in their own language, which would quite alter the character of the instruction, and the spiritual edification would clearly be the more effective. The East Carelians have for centuries been denied this natural right by the Russian supremacy.

The schools. Although the state ought not to interfere in religious matters further than is necessary for the protection of the right of the various permitted religious communities freely to exercise their worship, and for the suitable training of religious teachers, independently of creed, the state must on the other hand be responsible for public secular education, and a certain amount of technical teaching.

Since the year 1900, the Russian government has established in East Carelia a strikingly large number of elementary schools, more than in any other part of the whole Russian Empire. This was done in the interests of russification, so that the language of instruction is Russian throughout, in spite of the fact that most of the children when they first went to school, did not understand a word of that language. This must in any event be changed, so that the instruction may be given in the children's native tongue. The same thing is true of the higher schools. The need for trade schools has already been discussed. The women are particularly industrious and enterprising and good schools of housewifery would be very useful to them.

The land described in the above essays is practically unknown to the world at large, and little known even to us Finns, although it immediately adjoins our own country, and its people are of the same stock as the population of Finnish Carelia. We, as friends of this sorely tried but vigorous East Carelian people, have attempted to give a truthful picture of its present condition, its country, and its past fortunes. Its longing for freedom has grown strong, its hope of national freedom in union with Finland. Is that hope to be betrayed, or will the present remarkable time, with its violent international struggles over all frontiers, bring a happy solution of that question?

Russia is at present in a state of disintegration, and it can only emerge therefrom if unencumbered by foreign nationalities. It cannot be in the future a conglomeration of numerous different peoples as it was in the past. It was that condition, together with the tyranny exercised to keep the different nationalities together, which led to its dissolution. No one should deny the just demand of the Carelians to be united with Finland, even if they believed that Russia would thereby suffer real harm. Such a course would be another great crime against the Carelian people, and a crime against all sound progress, in the name of which that people is striving towards freedom and enlightenment.

The Finnish people has been driven into the most northerly territory of Eu-

rope, and there lived its life, divided in twain, and under differing conditions. The portion of that people which dwells in Finland has, under the influence of a common historic fate, coalesced with the Swedish inhabitants of that land into *one* people, the people of Finland. Now at last the hour seems to have come when it could be united with the Finnish people of East Carelia into a single whole. This would open a new future for our own Carelians, and the united Finnish people could develop its peculiar culture with united forces, in the common service of human civilisation.

THEODOR HOMÉN.



POPULATION.

PROVINCE OF ALEXAN-DROVSK (KOLA)		PROVINCE OF KEM		PROVINCE OF POVENETS		PROVINCE OF SAVODSK	
Town of Kola	Year 1910	Town of Kem	Year 1907	Town of Povenets	Year 1908	Town of Petrosav.	Year
Aleksandr.	1 000	Town of Suma	2 870	Rubajärvi commune	1 563	Munajärvi commune	"
Comm. o. Murm. Sett.	3 020	Town of Kandalaks Comm.	1 427	Repola	2 229	Kontupokja	"
Kola Lapp Comm.	2 164	Kouda	566	Paadene	2 716	Suurlahiti	"
Ponoï	524	Kieretti	719	Petrojääsko-Jam	1 092	Tepentisa	"
Tetrino	1 390	Oulanka	1 069	Porajärvi Commuüte	1 075	Tutvoja	"
Kuzomen	2 367	Kiestinki	1 906	Lintajärvi	1 477	Säämäjärvi	"
Umba	891	Viitasaipale	912	Määntyselkä	4 087	Sugja	"
		Pistojarvi	1 318	Daniitona	1 869	Jalgaba	"
		Vuokkiniemi	3 525	Sungu	7 537	Pyhäjärvi	"
		Uhtaa	3 005	Rimskaya	940	Ladva	"
		Poanajärvi	1 066			Soutjärvi	"
		Pontkama	1 892			Ostretshini	"
		Usmana	555				"
		Kontokki	1 872				"

POPULATION OF THE WHOLE AREA. 219,741

30° 38° 39° 40°

30° 62° 30° 61° 30° 60°

